

LIBRARY OF CONGRESS.

RG 531
Chap.----- Copyright No.-----

Shelf..P27

UNITED STATES OF AMERICA.





A MANUAL OF OBSTETRICS

BY

✓
EDWARD L. PARTRIDGE, M.D.

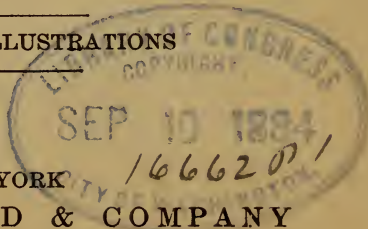
Professor of Obstetrics, New York Post-Graduate Medical School; Instructor in Obstetrics, College of Physicians and Surgeons, New York; Visiting Physician to the Maternity Hospital, and to the Nursery and Child's Hospital; Attending Gynecologist to the New York Hospital, Out-patient Department; Fellow of the New York Obstetrical Society.

10
4225
WITH SIXTY ILLUSTRATIONS

NEW YORK

WILLIAM WOOD & COMPANY

1884



RG 531

. P27

COPYRIGHT BY
WILLIAM WOOD & COMPANY.

1884.

PREFACE.

THE aim of this book is to give a concise and correct *outline* of that obstetric knowledge especially called for on the part of the medical student and general practitioner.

The medical student who desires to simplify and arrange his information, and at leisure moments to recall to his mind primary data necessary to his chain of knowledge, will find in this volume that which he desires, with, it is hoped, an appropriate emphasis accorded to the facts and opinions given. A considerable experience in class teaching has permitted the writer to know what subjects are stumbling blocks to the student, and special effort has been made to treat of these so that the mind may *intelligently* receive, retain, and impart a knowledge of them.

The writer having also a large personal ex-

perience in obstetrics, both in hospital and private practice, believes himself aware of the needs of the practitioner as well, and in him he hopes to find a satisfied reader on account of definite and proper estimate of value which has been given to symptoms, thus helping him to make or confirm diagnosis, and to remedies and methods of treatment.

In the effort to be concise it is believed that there has been no sacrifice of clearness.

CONTENTS.

	PAGE
CHAPTER I.....	1-17
Organs of Generation, Parts composing the Vulva, Vagina, Uterus, Fallopian Tubes, Ovaries, Broad Ligaments, Parovarium, Vessels, Nerves, and Lymphatics.	
CHAPTER II.....	18-39
Ovulation and Menstruation, Conception and Development of the Ovum, Graafian follicle, Ovule, Corpus luteum, Local and constitutional conditions associated with Menstruation, Fecundation, Composition of Semen, Sites of Impregnation, Changes in the Ovum, Blastodermic Membranes, Chorion, Amnion, Deciduæ, Placenta, Funis, Fetal Circulation.	

	PAGE
CHAPTER III.....	40-57
Symptoms and signs of Pregnancy, Duration of Pregnancy, Diseases of Pregnancy.—Systemic changes, Cessation of Menses, Morning Sickness, Mammary Signs, Pigmentation, Other reflex disturbances, Kiestine, Color of Vagina, Changes in the Uterus and Cervix, Quickening, Intermittent uterine contractions, Ballottement, Fetal heart-sounds, Uterine bruit, Duration of Pregnancy, Diseases of Pregnancy, digestive, respiratory, nervous, and circulatory, Albuminuria, Vesical Irritability, Affections of parturient Tract, Hæmorrhoids.	
CHAPTER IV.....	58-68
Abortion and Premature Labor.—Diseases of the Ovum, Extra-Uterine Pregnancy, Causes, Frequency, Symptoms, Prognosis, Diagnosis and Treatment. Moles: Carneous, Fatty, and Vesicular or Hydatidiform.	
CHAPTER V.....	69-106
Anatomy of the Pelvis.—Labor.—The Puerperal State.	

Os innominatum, Sacrum, Coccyx, Ligaments, Pelvis as a whole. Inclined planes, Measurements, Diameters, and Axes. The Fetal Head, Regions, Fontanelles, Sutures, Measurements. Labor: Cause of, Stages, "Bag of waters," Uterine Action, Duration, Presentation and Position. Mechanism in different head positions: Flexion, Descent, Rotation, Extension, and Restitution. Moulding, caput succedaneum. Management of Labor: Preparatory and succeeding stages, Care of Perineum, Attention to the newly born Child, Birth of Placenta. The Puerperal State: After-pains, Bladder, Lochia, Bowels, Retrograde uterine changes, Diet, Care of the Breasts.

CHAPTER VI 107-125

Precipitate, Tedious, and Obstructed Labor.—Deformity of Pelvis. Precipitate and Tedious Labor: Causes, Symptoms, Prognosis, Treatment. Obstructions in Maternal Soft Parts: Rigid Cervix, Carcinoma, Ante partum hour-glass contraction of uterus,

	PAGE
CHAPTER III.....	40-57
Symptoms and signs of Pregnancy, Duration of Pregnancy, Diseases of Pregnancy.—Systemic changes, Ces- sation of Menses, Morning Sick- ness, Mammary Signs, Pigmenta- tion, Other reflex disturbances, Kiestine, Color of Vagina, Changes in the Uterus and Cervix, Quick- ening, Intermittent uterine con- tractions, Ballottement, Fetal heart- sounds, Uterine bruit, Duration of Pregnancy, Diseases of Preg- nancy, digestive, respiratory, ner- vous, and circulatory, Albuminuria, Vesical Irritability, Affections of par- turient Tract, Hæmorrhoids.	
CHAPTER IV.....	58-68
Abortion and Premature Labor.—Dis- eases of the Ovum, Extra-Uterine Pregnancy, Causes, Frequency, Symptoms, Prognosis, Diagnosis and Treatment. Moles: Carneous, Fatty, and Vesicular or Hydatidiform.	
CHAPTER V.....	69-106
Anatomy of the Pelvis.—Labor.— The Puerperal State.	

Os innominatum, Sacrum, Coccyx, Ligaments, Pelvis as a whole. Inclined planes, Measurements, Diameters, and Axes. The Fetal Head, Regions, Fontanelles, Sutures, Measurements. Labor: Cause of, Stages, "Bag of waters," Uterine Action, Duration, Presentation and Position. Mechanism in different head positions: Flexion, Descent, Rotation, Extension, and Restitution. Moulding, caput succedaneum. Management of Labor: Preparatory and succeeding stages, Care of Perineum, Attention to the newly born Child, Birth of Placenta. The Puerperal State: After-pains, Bladder, Lochia, Bowels, Retrograde uterine changes, Diet, Care of the Breasts.

CHAPTER VI 107-125

Precipitate, Tedious, and Obstructed Labor.—Deformity of Pelvis. Precipitate and Tedious Labor: Causes, Symptoms, Prognosis, Treatment. Obstructions in Maternal Soft Parts: Rigid Cervix, Carcinoma, Ante partum hour-glass contraction of uterus,

Tumors Cicatricial closure, Cystocele, Vesical calculus, Rigid Perineum, Œdema of Vulva, Hæmatocele. Deformed Pelvis: Varieties. Rachitis, Osteo-malacia. Dangers to mother and child from labor with pelvic deformity. Diagnosis. Pelvimetry. Treatment.

CHAPTER VII. 126-159

Malpresentations.—Multiple Pregnancy.—Other conditions pertaining to the Uterine Contents.

Breech, Face, and Shoulder Presentations: Frequency, Varieties, Causes, Diagnosis, Mechanism, Prognosis, Treatment. Management of difficult Occipito-Posterior cases. Twins: Diagnosis, Peculiarity of Labor, Manner of presentation, Head locking, Prognosis, Treatment. Superfetation and Superfecundation. Excessive Fetal Development. Premature ossification of craniums. Hydrocephalus. Hydrothorax. Fetal Tumors. Monsters. Multiple Presentation. Dorsal displacement

of arm. Tough Membranes. Dry
Labor. Long or Short Funis.

CHAPTER VIII.....160-179

Hæmorrhage. Accidental Hæmor-
rhage, Placenta Previa, Post-partum
Hæmorrhage, Secondary Hæmor-
rhage. Varieties, Causes, Signs and
Symptoms, Diagnosis, Prognosis,
Treatment.

CHAPTER IX.....180-205

Unnatural and Complicated Labor.—
Puerperal Diseases. Prolapse of the
Funis. Inversion of the Uterus.
Rupture of the Uterus. Lacerations
of Cervix, Vagina, and Perineum.
Rupture of Pelvic Joints. Puerperal
Eclampsia. Thrombosis and Em-
bolism. Puerperal Insanity. Fre-
quency, Causes, Signs and Symp-
toms, Diagnosis, Prognosis, Treat-
ment.

CHAPTER X.....207-225

Puerperal Fever, Its relation to Sep-
ticæmia: Etiology, Nature, and Mode
of Action of the Septic Poison. En-
docolpitis, Endometritis, Metritis,

Parametritis, Perimetritis, Peritonitis, Septicæmia, Pathology, Symptoms, Prognosis, Prevention, and Treatment.

CHAPTER XI.....226-277

Obstetric Operations: The Forceps.—Craniotomy.—Embryotomy. — Decapitation. — Cephalotripsy. — Version —Induction of Abortion and of Premature Labor.—Laparo-elytrotomy.—Cæsarean Section.—The Porro Operation.—The Porro-Müller Operation.

MANUAL OF OBSTETRICS.

CHAPTER I.

THE ORGANS OF GENERATION.

THE ORGANS OF REPRODUCTION in the female are *external* or copulative, and *internal* or formative.

The external organs, also called the *vulva*, or *pudendum*, consist of all the parts visible externally, and to these may be added the vagina.

The *mons Veneris* is a cushion of adipose tissue covering the pubes. It is covered with skin, and after puberty is thickly supplied with hair.

The *labia majora* are two folds of integu-

ment, of rounded form owing to adipose tissue beneath them, situated one on each side of the orifice of the vulva, or *rima pudendi*. They extend from the mons Veneris, uniting posteriorly in front of the anus. They are covered with hair toward the outer side, while the opposing internal surfaces resemble mucous membrane, being supplied abundantly, however, with sebaceous glands, but no mucous follicles. The underlying adipose structure is rich in elastic tissue and blood-vessels, and in it the round ligament of each side terminates. After child-bearing or the wasting of age, the labia minora sometimes become visible, protruding between the labia majora. The extremities of the vulval fissure are called respectively the *anterior* and *posterior commissures*. The thin, crescentic fold of integument found in front of the posterior commissure is called the *fourchette*.

The *clitoris*, analogous to the male penis, is a small erectile body situated half an inch posterior to the anterior commissure. It is composed of two *corpora cavernosa*, which are continuous above with two *crura*, the latter being attached to the ascending rami of the ischia and the descending rami of the pubes. The *glans* is its rounded free extremity. It

has a miniature prepuce and frenum and is supplied with highly developed, terminal nerve bulbs, and abundant venous capillaries.

The *labia minora* or *nymphæ* are two nar-

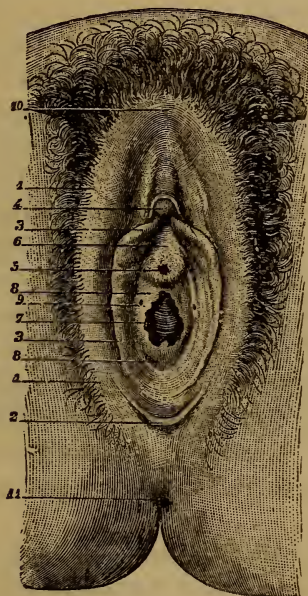


FIG. 1.—External Organs of Generation.

1, Labia majora; 2, Fourchette; 3, Labia minora; 4, Clitoris; 5, Meatus urinarius; 6, Vestibule; 10, Mons Veneris; 11, Anus.

row folds of mucous membrane arising from the prepuce and frenum of the clitoris above,

and terminating opposite the middle of the labia majora. Pavement epithelium covers their surfaces, which present small papillæ, and sebaceous glands having an odorous, cheesy secretion.

The *vestibule* is a triangular space bounded by the nymphæ as they diverge from the clitoris, and having the *meatus urinarius*, as a small prominence with central opening, at the middle of its lower boundary. The *urethra*, one and one-half inches long, extends backward, underlying the anterior wall of the vagina. It is extremely dilatable, though, by virtue of its muscular and elastic structure, readily recovering its natural size.

The internal pudic artery conveys blood to the vulva, the return circulation being through an extensive plexus of veins which chiefly constitute what is called *erectile tissue*.

The *bulbi vestibuli*, each an inch in length when distended, are two leech-shaped conglomerations of these veins, lying on each side of the opening of the vagina, between it and the sides of the pubic arch. They are connected with the veins of the clitoris, there being a smaller, intermediate plexus on each side called the *pars intermedia*. During co-

ition these veins, which have no valves, are turgid.

The *vulvo-vaginal glands*, first described by Bartholin, lie behind and more deeply seated than the bulbi vestibuli, being opposite the

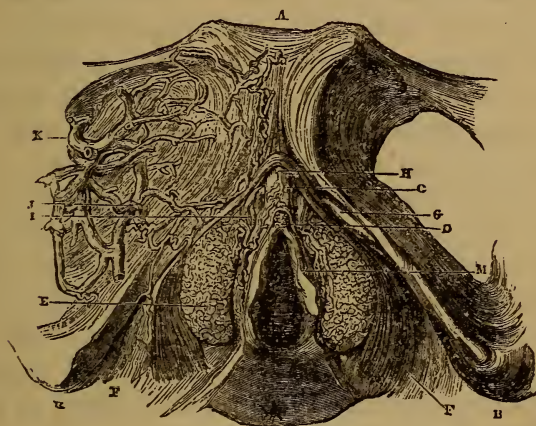


FIG. 2.

A, pubis; B, ischium; C, clitoris; D, glans of the clitoris; E, bulb; F, constrictor muscle of the vulva; G, left pillar of the clitoris; H, dorsal vein of the clitoris; I, pars intermedia; J, vein communicating with obturator vein; K, obturator vein; M, labia minora.

posterior boundary of the vaginal orifice. Each is as large as an almond, conglomerate, discharging by a single duct a copious, slightly viscid secretion at the posterior edge

of the vaginal orifice during coition and labor. The *fossa navicularis* is a shallow depression lying between the fourchette and *perineum*, the latter structure being muscular and triangular, having a base of an inch and a half extending under the skin from the vagina to the anus. Its apex is upon a higher level between the same tube structures. It serves as a column of support for the internal organs of generation, and the importance of care for its preservation during labor is obvious.

THE VAGINA is the curved canal connecting the external parts with the uterus. Through it the semen ascends, and the menstrual flow and products of gestation descend. Naturally it is collapsed, being more capacious above, and occupies the axis of the pelvis except that the lower end lies much nearer to the pubes than to the coccyx.

The anterior wall is two and one-half, the posterior three inches in length. Posteriorly, the middle three-fifths are contiguous to the rectum, except for a thin layer of connective tissue; between the upper fifth and the rectum, the pouch of peritoneum, called the *cul-de-sac of Douglas*, intervenes, while the lower fifth is situated in front of the perineal body. The anterior wall is connected with the bladder

and urethra by connective tissue. The upper end of the vagina, extending higher behind than in front of the cervix, is called the *fornix*. The wall is composed of involuntary muscular fibres, both longitudinal and circular, which are closely interwoven, surrounded by a sheath of connective tissue. The lining of mucous membrane possesses numerous vascular papillæ, but no secreting glands, and is covered with pavement epithelium. It presents numerous transverse folds, called *rugæ*, which are removed by parturition. The *anterior* and *posterior vaginal columns*, situated in the median line, are longitudinal ridges, the anterior being the more prominent. A network of capillary vessels encompasses the vagina. The *sphincter-vaginæ* muscle surrounds the lower extremity, and the vaginal orifice is more or less closed by a thin, crescentic fold of mucous membrane, called the *hymen*, the remains of which, after child-bearing, consist of fleshy eminences, called *carunculæ myrtiformes*, about five in number.

THE INTERNAL ORGANS are the *uterus*, *Fallopian tubes*, and *ovaries*.

The uterus is a hollow, flask-shaped organ, situated between the bladder and rectum, its summit being below, and its long diameter

corresponding to the axis of, the pelvic brim, It is capable of frequent and considerable change of position, owing to its suspension by connective tissue and ligamentous structures, and to changing conditions of the adjacent

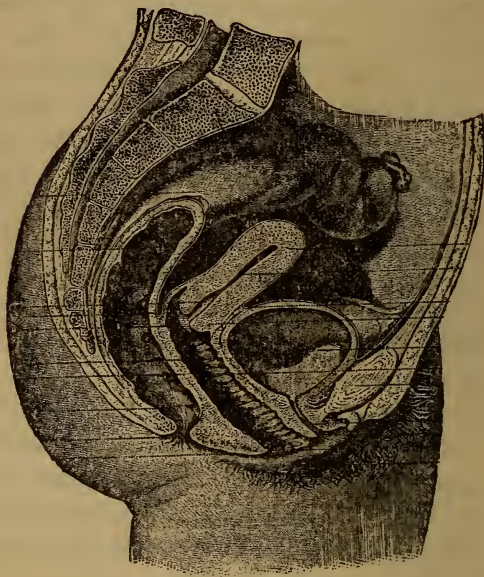


FIG. 3.—Uterus, Vagina, etc.

organs. It has an upper convex border, the posterior surface being convex, the anterior flattened. Its superior angles are the points of entrance of the Fallopian tubes, its width

at this region being an inch and a half. The walls vary in thickness at different points, between three and four lines near the cervix, and ten or twelve at the centre of the body. Its cavity measures two and one-half inches,



FIG. 4.—Uterine Cavity.

its weight is a little more than an ounce, and it is divided into three parts: the *fundus*, that portion above the entrance of the Fallopian tubes; the *cervix*, which is the lower portion shaped like an inverted truncated cone; and the *body*, which intervenes between the fun-

dus and cervix. The slight constriction at the junction of the cervix and body makes the uterus pear-shaped, and it is opposite this point that the peritoneum is reflected from the uterus upon the bladder, while posteriorly the peritoneal covering descends so as to cover the upper part of the vagina before being reflected upward upon the rectum. Laterally, the peritoneum spreads outward to the sides of the pelvis, forming the *broad ligaments*.

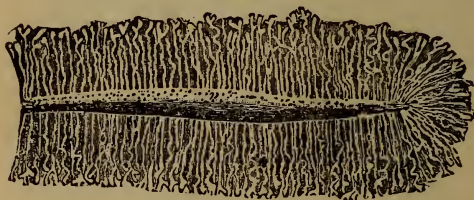


FIG. 5.—Utricular glands of the Uterus.

The cavity of the body is lined with mucous membrane which is continuous with that of the Fallopian tubes and of the cervix. It is closely attached to the subjacent uterine structure, is one-twelfth of an inch thick, and presents columnar epithelium covered with cilia. The shape of the cavity is triangular, and the walls are separated by a small collection of mucus only. The *utricular glands* are tubular, having single or branching, blind

extremities, being lined by cylindrical cells. Their depth corresponds to the thickness of the mucous membrane. Beneath and between them are capillaries which are the source of the menstrual flow. The *cavity of the cervix* is fusiform; its narrowed points of communication with the uterine cavity and with the vagina are called respectively the *internal* and *external os uteri*. The *arbor vitæ* consists of *four firm prominent ridges*—anterior, posterior, and lateral—with *transverse ridges* arising at angles more or less acute. On the summits of, and in the sulci between these ridges, are the openings of simple follicles, called *glands of Naboth*, which secrete the alkaline, transparent, viscid mucus which always occupies the cervical cavity. Toward the external os, are seen numerous clavate papillæ which are simply elevations of mucous membrane. The upper part of the cervix is lined with columnar and ciliated epithelium, while that found in the lower portion and on the external surface of the cervix is tessellated. The uterine wall is composed of unstriped muscular fibres, connective and elastic tissue, the former greatly predominating. The developed muscular fibres are fusiform, containing a nucleus,

while small undeveloped corpuscles are numerous. During pregnancy *only*, the arrangement of these fibres can be seen comprising three layers. The thin, superficial layer arises at the cervix, and passes upward and outward toward the Fallopian tubes. The middle, thick layer is a close interlacement of fibres surrounding the blood-vessels. The thin, internal layer consists of circular rings having for their centres the orifices of the Fallopian tubes and the os uteri.

After child-bearing, the uterus is larger, more rounded, with a somewhat patulous cervix and external os, the latter more or less fissured.

Folds of peritoneum maintaining the uterus in position are called *vesico-uterine*, *sacro-uterine*, and *broad ligaments*.

THE BROAD LIGAMENTS, consisting of two layers of peritoneum passing from the anterior and posterior surfaces of the uterus to the sides of the pelvis, divide the cavity of the latter into two parts, and each ligament contains, in its folds, loose cellular tissue, some muscular fibres continuous with those of the uterus, the round ligament, ovary, parovarium, Fallopian tube, blood-vessels, nerves, and lymphatics.

The round ligaments, mainly of muscular structure, pass from the upper angles of the uterus downward and forward through the inguinal rings into the labia majora.

THE FALLOPIAN TUBES, three or four inches in length, pass from the uterus outward, downward, and backward. Each terminates in a free extremity near the ovary. It transmits the spermatozoon toward the ovary, and



FIG. 6.—Ovary and Fallopian tube, the latter laid open.

the ovum to the uterus. It can be felt, cord-like, at the upper edge of the broad ligament. The walls—consisting of external or longitudinal and internal or circular, unstriped muscular fibres—have an internal lining of mucous membrane covered with ciliated epithelium, producing a current toward the uterus. The lining membrane presents nu-

merous longitudinal folds. The outer *fimbriated extremity* is expanded and trumpet-shaped, having fringe-like processes, one of which, being longer than the others, is attached to the ovary, and directs the external orifice downward to receive the discharged ova. The mucous lining is continuous with the peritoneal covering. The uterine opening of the tube is slightly dilated, and will admit a fine bristle. Galvanism shows the tubes to possess peristaltic movement which assists the movements of spermatozoa and ova.

THE OVARIES are flattened ovoid bodies, an inch and a half long, three-fourths of an inch in breadth, and half an inch thick, each weighing about eighty grains. Situated nearer to the pelvis than to the uterus, each is united to the latter by a band called the *ligamentum ovarii*. The posterior layer of the broad ligament covers the ovary, and that portion which surrounds the vessels which enter the ovary on its anterior surface is called the *mesentery* of the ovary. The point at which the vessels enter is called the *hilum*. The layer of the broad ligament which cover the free surface of the ovary differs from peritoneum in that it is covered

by cylindrical (in early life called *germ epithelium*) instead of tessellated epithelium. This explains the statement, which is frequently seen, that the peritoneum does not cover the ovary. Beneath this layer is the *tunica albuginea*, a strong, fibrous covering, closely connected with the ovarian body. The ovary is composed of two parts, the *medullary* portion, which is reddish, spongy, and vascular,



FIG. 7.

and the *cortical* portion, of grayish color, containing the Graafian follicles. The ovary is made up of muscular structure, connective tissue, and elastic fibres, the cortical portion containing less muscular and more connective structure than the medullary portion.

The Parovarium or organ of Rosenmüller

is found between the layers of the broad ligament, near, and connected with, the upper and outer part of the ovary. It is the analogue of the epididymis in the male, and is the remains of the Wolffian body. It consists of slightly tortuous, closed tubes, ten to twenty in number, arranged in pyramidal shape with the apex toward the ovary.

The vascular supply to the internal organs of generation is derived from the internal iliac and ovarian arteries. The vessels enter and return between the layers of the broad ligaments. The arteries of the uterus are unusually large for an organ of its size, and on account of their tortuous course are called *curling arteries*.

The vessels of the ovary enter and leave at the hilum. The cellular tissue structure of the broad ligaments contains an elaborate network of veins, two portions of which are called respectively the *plexus uterinus* and the *plexus pampiniformis*.

Nerves of the uterus are from the sympathetic system, with some filaments, chiefly about the cervix, from the cerebro-spinal system.

Lymphatic vessels are found throughout the uterus and adjacent cellular tissue ac-

companying the veins, and beneath the mucous membrane of the uterus and between its muscular fibres are found numerous lymph spaces.

CHAPTER II.

OVULATION AND MENSTRUATION—CONCEPTION, AND DEVELOPMENT OF THE OVUM.

THE GRAAFIAN FOLLICLES are formed during fetal life from the germ epithelium cov-



FIG. 8.

ering the ovary, inflections of that covering taking place, bringing them into the ovarian structure. Of an entire number of about

thirty thousand, comparatively few become mature. When undeveloped they can be seen by the aid of high magnifying power only, but having reached maturity they are visible to the naked eye as prominent vesicles on the surface of the ovary. With the general development attending puberty the first follicle matures, and during the child-bearing age a similar change occurs in one or more of the



FIG. 9.—Graafian Follicle.

1, Ovule; 2, Membrana granulosa; 3, Tunica propria; 4, Tunica fibrosa; 5, Ovarian stroma.

follicles at regular periods, except during pregnancy and lactation. As the Graafian follicle becomes ripe it approaches the surface of the ovary, and consists of an investing membrane composed of two layers; the *external*, highly vascular, called the *tunica fibrosa*, and the *internal*, or *tunica propria*.

Within is found the *membrana granulosa*, which consists of cylindrical epithelial cells, while at one point in the cavity of the follicle, near the surface, the *ovule* is seen situated in a dense aggregation of the cells of the *membrana granulosa*, known as the *discus proligerus*. The remainder of the cavity of the follicle is occupied by a transparent fluid called the *liquor folliculi*, which is traversed by a few filamentous bands

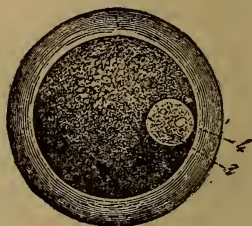


FIG. 10.—Human Ovule.

2, Zona pellucida; 3, Germinal vesicle; 4, Macula germinativa.

or *retinacula*. The fluid of the follicle is formed by disintegration of cells of the granular membrane. The *ovule* is a cell $\frac{1}{120}$ of an inch in diameter, having a thick wall called the *zona pellucida*, or *vitelline membrane*. Its cavity contains a granular mass of protoplasm called the *vitellus* or *yelk*. Near

its centre is the *germinal vesicle*, a clear cell $\frac{1}{20}$ of an inch in diameter, and contained within this is the *germinal spot*, $\frac{1}{3000}$ of an inch in diameter. OVULATION consists in the *maturation* of the Graafian follicles and discharge of the ova. The liquor folliculi, increasing in amount, stretches and thins the wall of the follicle until its rupture takes place, this latter event being precipitated by sudden tension produced by ovarian congestion, usually with hemorrhage into the follicle, which may result from menstrual or sexual excitement. This laceration allows the escape of the ovule surrounded by cells of the membrana granulosa. The cavity of the follicle after escape of the ovule is soon lined and then filled with convolutions of a yellow color. When examined, these are found to consist of granular material, resulting from absorption of coloring matter from the blood previously effused in the follicle, and from proliferation of the cylindrical epithelium which remains from the membrana granulosa. Numerous capillaries appear in the walls of the follicle.

The *corpus luteum* is the name given to the follicle thus altered, which, under the stimulus of pregnancy, increases in size until the

fourth month, and then slowly diminishes until complete atrophy has taken place, six or eight weeks after labor. The greatest size attained is an inch in length by half or three quarters of an inch in thickness. If impregnation does not occur, the development is never greater than to equal the size of a small pea, and at the end of two months a stellate cicatrix alone remains.

MENSTRUATION is the sanguineous discharge from the uterus regularly recurring about every twenty-eight days, from the time of puberty until the menopause. It is often irregular during the early months and those preceding its final discontinuance, and usually does not occur during lactation or wasting diseases. Normally about three ounces of blood are lost, which is kept from coagulating in the cervix by the alkaline secretions of the glands of Naboth, and, unless an excessive hemorrhage takes place, the admixture of vaginal mucus is sufficient to prevent coagulation in the vagina.

The greater part of the uterine mucous membrane is shed at each menstrual period, being renewed subsequently. In most women menstruation is coincident with *maturation* or *rupture*, of the Graafian follicle, the con-

gestion of the ovary producing, through its nervous connection with the uterus, a similar condition of that organ.

CONCEPTION, which is the first stage of generation, results from the physiological union of the elements of life from both sexes.

The SEMEN contains the vivifying principle of the male. It is a secretion from the testicle after puberty, opalescent, slightly viscid, has a faint, peculiar odor, and contains inorganic salts, chiefly phosphates and chlorides, and an albuminous ingredient called spermatine. Microscopically, it is found to consist of *transparent fluid* derived mainly from the prostate and Cowper's glands, but partly from the testes, *spermatozoa* and *sperm cells*, the latter being seen only in the recent secretion within the testicles.

The *spermatozoon*, which is essential to fecundation, has an entire length of $\frac{500}{1000}$ of an inch, and consists of an oval head $\frac{1}{6000}$ of an inch in diameter, and a filamentous extremity. The *sperm cells* are spherical, containing three to ten nuclei. Each nucleus, called later in its development, *secondary cell* or *vesicle of evolution*, produces a sperma-

tozoon. The wall of the secondary cell usually disappears before rupture of the sperm (or *parent*) cell, leaving a cluster of spermatozoa within the latter cell. Finally, on rupture of the germ cell, the spermatozoa are disseminated throughout the semen.

The SITES OF IMPREGNATION are usually the surface of the ovary or the outer part of the

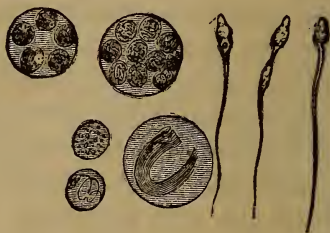


FIG. 11.

Fallopian tube, and fecundation results from a penetration of one or more of the spermatozoa *into* the ovule. This may occasionally take place in the cavity of the uterus, while in the lower animals the spermatozoa have been seen in the ovule while still contained in the unruptured Graafian follicle. The spermatozoa may retain vitality for eight or ten days after entering the female organs, or may be destroyed by acid vaginal secretions

before reaching the uterus. They may be thrown directly into the uterus, or, if deposited at the vulva, may ascend, owing to their power of motion derived from the vibratile, cilia-like extremity.

After entering the uterus, ascent is favored by capillary attraction, which force depends upon the nearness of the internal uterine surfaces. Peristaltic action of the Fallopian tubes aids the passage toward the ovary.

The ovule, if it *escapes* the vivifying contact of the spermatozoon, disintegrates in a short time after its discharge from the ovary. Whether or not fecundation occurs, there is a disappearance of the germinative vesicle and the appearance of a small bluish spot at some point underlying the zona pellucida, indicating the situation at which the cephalic end of the fetus would be formed. This is called the *polar globule*. The yelk also contracts, and at one point leaves a space called the *respiratory chamber*, which is usually filled with a transparent fluid.

CHANGES IN THE OVUM appear within twenty-four hours after fecundation, the first being the appearance of the *vitelline nucleus*, which is a small, clear vesicle like an oil drop, in the centre of the vitellus.

Segmentation of the yelk immediately follows, consisting in a cleavage into two parts, each part into two others; and a similar con-



FIG. 12.—Segmentation of the Ovum.

tinuation of this division produces a mass of small spheroidal bodies each containing a cell, formed from the vitelline nucleus, which divides and subdivides with the division of

the yelk. The mass thus formed is called the *muriform body*. These cells uniting by their edges, become flattened, and retiring toward the circumference of the yelk, leave a central space containing clear fluid. This peripheral wall of cells then separates into three layers, known as *blastodermic* membranes. The external, or *epiblast*, being that part from which the bones, muscles, integument, nervous system, serous membranes, and amnion are developed. The internal, or *hypoblast*, forms the alimentary canal, while the middle layer, or *mesoblast*, forms the circulatory system and the bladder. The *area germinativa* next appears, and is an aggregation of the cells of the blastoderm, oval in shape, having in its centre the faint indication of the foetus called the *primitive trace*. Immediately surrounding the latter is a translucent area called the *area pellucida*. On each side of the primitive trace, ridges, called *laminæ dorsales*, appear, which meet, producing a canal between them which contains the spinal cord. The embryo becomes arched, the convexity looking outward, the cephalic and caudal ends approaching each other. The *amnion*, one of the foetal envelopes, is formed from the epiblast, arising by

two projections, one from each foetal end. These taking a curved direction, pass over the back of the foetus until they meet. It is continuous with the integument of the foetus, and covers the umbilical cord. The projections of the amnion which approach



FIG. 13.—Area Germinativa.

1. Zona pellucida; 2. Germinal membrane; 3. Area vasculosa; 4. Area pellucida; 5. Primitive trace.

each other in front of the fetus, constrict the hypoblast, a portion of which becomes included within the fetus and forms the alimentary canal, while, connected with this by the vitelline duct, the much larger portion remains suspended from the abdomen of the fetus, forming the umbilical vesicle. The

vitelline duct and a vascular arrangement known as the *omphalo-mesenteric circulation*, convey pabulum to the fetus from the umbilical vesicle, until the supply is exhausted, and then the shriveled remains of the vesicle only are found attached by a filamentous pedicle to the fetus. This may be seen as large as a flattened pea, after delivery at term, between the chorion and amnion, usually near the placenta.



FIGS. 14 and 15.—Early Development of the Ovum.

The *allantois*, developed from portions of the internal and middle blastodermic layers, appears about the twentieth day as a sac-like projection from the inferior end of the abdominal opening, passing forward through the space (which contains, also, the pedicle of the umbilical vesicle) still left between the amniotic projections in front of the fetus. The

allantois completes its course in a few days by expanding rapidly until it completely lines the external blastodermic layer, and in



FIGS. 16 and 17.—Formation of Amnion and Umbilical Cord.

the structure of the allantois a vascular system is developed which unites the fetus to the mother and by which it begins to be

nourished, coincident with the failure of supply from the umbilical vesicle. The projections of the amnion having met behind the fetus, a closed cavity is formed which contains a watery fluid, the *liquor amnii*, secreted by the epithelial lining of the amnion. This fluid, gradually accumulating, distends the amnion until it is pushed in contact with the chorion, the space (while it existed) between the amnion and chorion having been occupied by the *vitriform body*, composed of a gelatinous material, analogous to Wharton's jelly, traversed by filamentous cords. The liquor amnii surrounds the fetus, and increasing in amount, allows its movements to be comparatively painless to the mother and, at the same time, protects it from injury.

THE CHORION: The external investing membrane of the ovum, at first called the *primitive chorion*, consists of the vitelline membrane with an outer albuminous coating, serving for nutrition, derived from the Fallopian tube during the passage of the egg.

The *true chorion*, formed later, consists of the external blastodermic layer reinforced by the allantois. These, rising up until in contact with, finally take the place of, the primitive chorion. On its external surface a shaggy

appearance is soon observed, owing to the development of thickly-set, branching, finger-like processes called *villi*. They force themselves into the substance of the decidua, soon rendering the decidua and chorion inseparable. At first non-vascular, after the growth of the allantois each villus receives an arterial twig, which gives off a branch to each process of the villus. The villi are equally distributed over the entire chorion until the end of the



FIG. 18.—Deciduæ.

second month, when they gradually disappear, except over one portion, where, by their still greater development, the *placenta* is formed.

THE DECIDUÆ are the coverings of the ovum afforded by the uterus, and consist of hypertrophied mucous membrane with special increase of the inter-glandular connective tissue. Under the microscope are seen connective tissue cells and fibres, and utricular gland tubes. The increased blood-supply to the

pregnant uterus leads to the formation of these membranes. The ovum having entered the uterine cavity, becomes lodged in some crypt of the lining membrane, and is soon surrounded by the developing deciduæ. The *decidua vera* is the lining proper of the uterus,



FIG. 19. — Placenta and umbilical cord.

and that portion of it situated between the ovum and the uterus is called *decidua serotina*. After lodgment of the ovum, processes of membrane grow up about its circumference, finally inclosing it, and this is called *decidua reflexa*. The end of the third month is nearly reached before the egg has attained a size sufficient to occupy the entire uterine cavity. When, however, this is accomplished, the re-

flexa and *vera* are brought in contact. After the third month these membranes gradually become thin and fibrous, and near the end of pregnancy their attachment to the uterus becomes loosened by fatty degeneration.

THE PLACENTA conveys nutriment to, and



FIG. 20.—A villus.

oxygenizes the blood of, the fetus, and from the time of its formation to its full growth varies only in size. At term it is eight inches in diameter, of circular shape, spongy consistency, weighing from sixteen to twenty-four

ounces. The cord is inserted near the centre usually,—sometimes near the edge producing resemblance to a *battledore*,—the amnion being reflected from its fetal surface so as to form a sheath for the cord.

It consists of an enlargement, lengthening and branching of the villi of the chorion over a certain area usually situated near the fun-

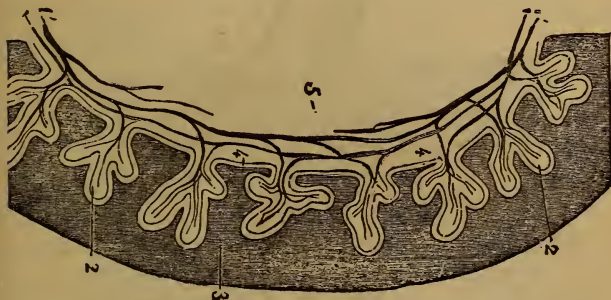


FIG. 21.—Villi of chorion dipping into uterine sinus.

dus uteri. Minutely examined, the maternal surface shows the villi described, which dip into the large uterine blood-channels called *sinuses*. Each villus has a thin wall through which, by endosmosis, there pass nutrient, proximate principles and oxygen from the mother's blood into the blood of the fetus which circulates through the villi. There is *no direct* interchange of blood between fetus

and mother. The decidua which lay beneath the placenta, becoming part of its structure, it is in this that the large sinuses are found containing maternal blood.

THE UMBILICAL CORD, or *funis*, averaging twenty inches in length, of about the size of the little finger, connects the fetus with the

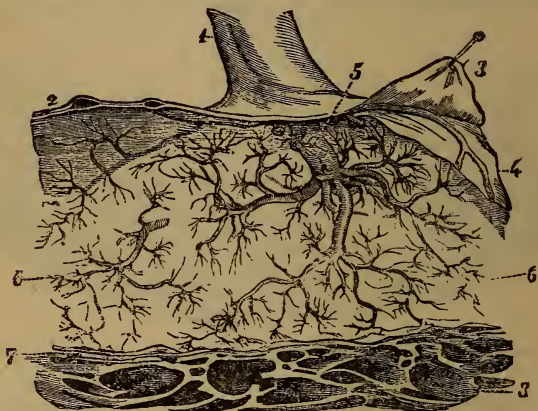


FIG. 22.—Section of placenta.

1, Umbilical cord; 2, 3, serous covering; 4, 5, 6, placental vessels from fetus; 7, 8, uterine sinus carrying maternal blood.

placenta, and carries blood to and from the latter. It is composed of the pedicle of the allantois with the *umbilical vein* and two *arteries*, the remains of the pedicle of the umbilical vesicle, the gelatin of Wharton, and

an outside sheath of amnion. The arteries take a spiral direction, as often toward the right as toward the left, terminating in the capillary branches to the villi. The *gelatin of Wharton* constitutes most of the bulk of the funis, protecting its vessels from injury. It contains amorphous matter and some connective-tissue cells, derived chiefly from the allantois. The cord has been seen as short as three, and as long as sixty inches.

THE FETAL CIRCULATION has certain interesting peculiarities depending chiefly upon the absence of the pulmonary function in the fetus. The blood from the placenta entering at the navel goes to the liver, a small part serving to nourish that organ while the greater part enters the inferior vena cava through the *ductus venosus*. Here it becomes mixed with blood from the fetal lower extremities.

Entering the right auricle, this blood passes directly through the *foramen ovale*, guided by the *Eustachian valve*, to the left auricle, and through the left ventricle and aorta to the head and upper extremities.

Returning, it enters the right auricle again, and this current of blood passes *in front* of the Eustachian valve into the right ventricle. Entering the pulmonary artery, a small

amount supplies the quiescent lungs, while the greater part passes directly through the *ductus arteriosus*, reaching the aorta beyond

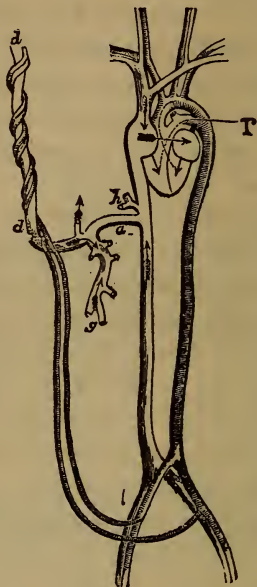


FIG. 23.

a, Ductus venosus; *d*, umbilical vein; *g*, vena portæ; *h*, hepatic vein; *r*, ductus arteriosus.

the giving off of the innominate, carotid, and sub-clavian arteries, and continuing downward, supplies the lower part of the fetus. The blood is then returned through the um-

bilical veins to the placenta, though some passes into the inferior cava and upward, to be again circulated through the fetus.

After birth, when aeration of the blood depends on the respiratory function, the ductus arteriosus, ductus venosus, and umbilical vessels are converted into fibrous cords, and the Eustachian valve permanently closes the foramen ovale.

It can be readily perceived, therefore, that the large size of the fetal liver and brain, disproportionate to other organs, is the result of a supply of *purser blood* to them than to other fetal parts.

CHAPTER III.

SYMPTOMS AND SIGNS OF PREGNANCY.—DURATION OF PREGNANCY.—DISEASES OF PREGNANCY.

PREGNANCY exerts certain general effects upon the system.

The entire volume of blood is increased, mainly by increase of the watery elements. There is a *larger amount of fibrin* (hyperinosis) and an *increased number of leucocytes*, with a *deficiency of red corpuscles, albumen and salts*. *Urea* and *carbonic acid* are present in considerable quantity. The increased amount of blood, with hydræmia, and the vascular area increasing with uterine growth, call for increased cardiac action which brings about *slight cardiac enlargement*. The augmented activity in other organs tends to slight increase in their size also.

A decided impression upon the nervous system is perceived. Pregnant women are

whimsical and generally depressed, though exhilaration of spirits is sometimes seen.

Osteophytes, or thin calcareous deposits, are often found on the inner surface of the calvarium.

Cessation of menses is the rule in pregnancy, and gives the first warning of the condition. Sanguineous discharge, when occurring after impregnation, is usually from some part of the cervix, is caused by erosion or polypus, and is irregular in time and amount. There are a few instances in which a menstrual discharge continues regularly, throughout a portion or the whole of pregnancy, from some part of the uterine surface not in contact with the ovum, or from the cervix, and in these cases it is probable that the function of ovulation is not in abeyance. *Amennorrhœa without pregnancy* may result from well-known causes. A knowledge of the patient's menstrual habits, absence of other signs of pregnancy, with frequently some characteristic disturbance of the general health, will aid in the diagnosis. In healthy women, habitually regular, cessation of menses indicates pregnancy in 80 per cent of instances. Pregnancy may occur in girls who have never menstruated.

Nausea and vomiting, called also *morning sickness*, most commonly begins in the second, rarely lasting after the fourth month. These signs may commence earlier, or continue to the end of pregnancy. In typical cases, the woman has nausea upon the first movement from the recumbent posture in the morning, and vomits occasionally during the forenoon, either food which has been taken, or glairy mucus. The disturbance is produced in a reflex way from irritation of uterine nerves, and cases of unusual severity are often explicable by the discovery of unusual *uterine tension, displacements, flexions, or morbid conditions of the cervix*. These symptoms may be intentionally simulated, or nervous women who desire or fear pregnancy may imagine them present in the lesser degree.

Cravings for unusual articles of food are very common in pregnancy.

Mammary changes, dependent upon the intimate relation through the nervous system, between *mammæ* and uterus, begin about the second month. At first tender and slightly enlarged, the breasts become more firm, with marked appearance of *superficial veins*. The *follicles* in the areola surrounding the nipple, some of which communicate with the lacti-

ferous tubes, become enlarged and quite prominent. The *nipple* becomes erect and turgid, being covered with scales formed from epidermis and the drying of watery *milk* which begins to be secreted after the fourth month. The breasts continue to enlarge, and the *areolæ* darken from pigmentation, in-

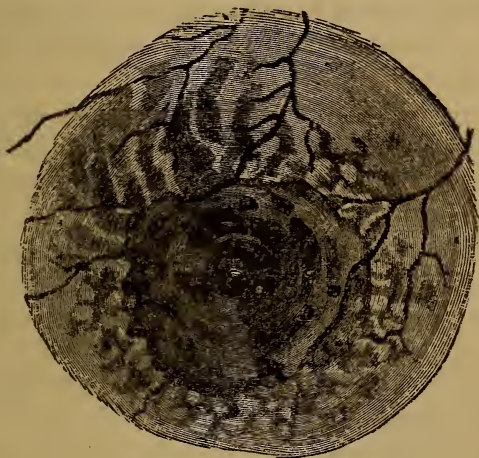


FIG. 24.

crease in area, and become prominent. The *secondary areola* consists of less pigmented spots irregularly situated just beyond the periphery of the areola. These changes in color are most marked in persons of dark complexion. The mammary signs are not

fully developed, until others, quite as indicative of pregnancy, are present, and as they somewhat remain after child-bearing, they are most important in primiparæ. Even the presence of milk in the breasts of primiparæ is not conclusive, as it has been observed in young girls, and even in the male breast.

Pigmentation is common along the median line of the abdomen, and often present about the face.

Other reflex disturbances, such as *syncope*, *ptyalism*, and *toothache*, are common enough to be regarded as the result of something more than accidental coincidence.

Kiestine is a peculiar, albuminoid pellicle containing *triple phosphate crystals* and vibriones, always present in the urine of pregnant women between the second and eighth months. It is present under other conditions than pregnancy, and can be of only corroborative importance. It appears in from two to five days after urine is voided, rises to the surface, and finally disintegrates.

Changes in the uterus can be noted between the second and fourth months under the favoring conditions of lax abdominal walls, with little adipose tissue. The uterus becomes *enlarged* and *globular*, often imparting a sense

of *fluctuation* to the examining finger. The increase in growth of its walls is from development of the *muscular fibres* and *cells*. It early acquires slight *right obliquity*, which it usually retains. Before the fourth month, it often *descends* a little in the pelvis, producing *flattening* of the *region between the pubes and navel*. After the *fourth month*, the *fundus* is perceptible *above the pubes*; at the *sixth month*, a little *above the umbilicus*; and at the *middle of the ninth*, just *below the ensiform cartilage*. During the *last two weeks* of pregnancy, the uterus *descends* somewhat. During the latter half of pregnancy, it projects anteriorly, so that its axis forms with the horizon an angle between 30° and 45° . The navel usually protrudes.

The *cervix*, early in pregnancy, becomes *softened* and *enlarged*, being occupied by a *mucous plug*. It makes much less resistance to the examining finger, there being also a fulness of the lower uterine segment and vagina, therefore, as pregnancy advances, the impression of a shortened cervix is conveyed. No *shortening actually* occurs, except during the few weeks preceding labor, when some *unfolding* takes place from below upward—

the internal os almost always remaining undisturbed.

Vesical symptoms, such as frequent desire to urinate, with or without pain, occur chiefly during the second and third months, and again late in pregnancy, from descent and pressure of the uterus against the bladder.

The vagina acquires a deep blue color from impediment to return of venous blood from uterine pressure—other results of the constant congestion being moderate hypertrophy of its walls and leucorrheal discharge. All the pelvic connective tissue becomes succulent.

Quickening is the perception of fetal movements by the mother. This usually occurs at about four and one-half months, as it is not until then that the movements attain much vigor, or that the uterus is in contact with the anterior abdominal wall, by which the impulse of movements is more readily appreciated than by the uterine surroundings in the pelvis. The earliest sensation is of slight fluttering, but in advanced pregnancy the movements are violent and often painful. Women who are either not pregnant or carry dead children so often claim to perceive quickening, mistaking for it the motion of flatus, or the rolling of a dead child, that the symp-

tom is not uniformly reliable. Women are occasionally delivered of living children, who have not been conscious of quickening during the latter part, or even the whole of pregnancy.

Intermittent uterine contractions, not productive of pain, occur during the whole of pregnancy. At any time when the hand can be placed upon the uterus, if retained there sufficiently long, a marked hardening can be perceived occurring at intervals of about ten minutes. *Ballottement*, or *passive motion of the fetus* is a sign obtainable between four and one-half and seven months. When unquestionably recognized by an experienced observer, it is a certain indication of pregnancy. For examination the patient should be placed upright or semi-recumbent, and the examining finger placed against the lower segment of the uterus in front of the cervix. A sharp push is made with the finger, and the fetus, being in contact with the inner wall, is made to rise in the liquor amnii, and, falling, strikes against the finger, informing the operator of its presence. *External ballottement* is the same manœuvre practised on the outside of the abdomen with the woman on her side.

The fetal heart sounds afford an infallible sign, being heard with increasing force and distinctness after the fifth month. The frequency is between 120 and 160. As a rule, the larger the child the slower is the pulse—and as large children are more frequently males than females, the rapidity of the fetal heart is a guide to the sex of the child in a majority of cases. The site at which the sounds can be heard varies with the position of the fetus. The most common situation is midway between the navel and left, anterior, iliac spine, the back of the child serving best for their transmission. When the child is alive, they may not always be heard, owing to some position which fails to allow of transmission to the examining ear. Repeated auscultation rarely fails to find them, however.

Fetal movements and discovery of fetal parts, as recognized by the physician, constitute an infallible proof of the condition, but may not be obtained owing to death of the fetus, or to adipose deposit in the abdominal wall. Jerky action of abdominal muscles may simulate fetal movements.

The uterine bruit is a whizzing murmur produced after the fourth month by the blood passing through the *sinuses* and *enlarged*

curling arteries of the uterus. It was erroneously attributed to the *utero-placental* circulation until it was shown to be present for several days after delivery, or when the uterus contained fibroids, or in cases of *placenta previa*, heard only at the fundus.

Differential diagnosis between pregnancy and *ovarian* or *fibroid tumors*, *ascites*, *adipose cake*, *menstrual retention*, *subinvolution*, *areolar hyperplasia*, or *phantom tumor* requires thoughtful attention, but to properly discuss this subject would involve a consideration of the histories of these conditions which would be out of place in this volume.

THE DURATION OF PREGNANCY is about 278 days, the time being divided by various writers into periods of forty weeks, ten lunar months, or nine calendar months. The exact day of conception—not the fertile coition—can never positively be known, owing to the fact that spermatozoa may retain their vitality in the female organs for some days before their contact with an escaping ovule. It is generally true that conception occurs at some time during ten days immediately succeeding a menstrual epoch, and the simplest way to estimate the probable date of labor is to add seven days to the date of the beginning of the

menstrual period and count back three months. Thus, if a woman began to menstruate on September 20th, an estimate made in this way would fix upon June 27th as the day nearest to her delivery. Occasionally impregnation occurs within a day or two preceding the time at which menstruation is expected, and the discharge does not occur. In such instances—generally recognizable only after labor—nearly ten months elapse between menstruation and labor.

THE DISEASES OF PREGNANCY arise by *sympathetic irritation*, by *mechanical pressure*, or *in the uterus* itself, and many of them are simply exaggerated symptoms. They may be classified into those involving, 1st, *digestion*; 2d, *respiration*; 3d, *the nervous system*; 4th, *circulation*; 5th, *secretion and excretion*; 6th, *the uterus*.

DIGESTION.—a. *Nausea and vomiting* may be present to a degree which involves the comfort or threatens the life of the patient. When excessive and long continued, great prostration ensues, in part from the distress of the condition itself, in part from its result—*inanition*. It must be remembered that a pregnant woman can bear considerable discomfort from nausea and vomiting without

serious effect upon her general condition, yet when they persist during all parts of the twenty-four hours for a considerable time, grave symptoms appear, such as *emaciation, rapid and weak pulse, coated and dry tongue, pinched countenance*, and, in the worst class of cases, *insomnia, pain, fever, great thirst, fetid breath*, and *hæmatemesis*. Finally, and often fortunately, unless relief is obtained, the uterus expels its contents.

The treatment is to promote nutrition, while medicinal agents are used to control the cause of the symptoms. To promote nutrition, regulate the functions of the entire alimentary tract, and use highly nutritious diet in small amounts, frequently given, and when the patient is recumbent. Nutritive enemata often prove of great help. Applications to epigastrium of blistering agents or ice are useful. Internally, bismuth, oxalate of cerium, acid hydrocyan. dil., creasote, effervescing drinks, champagne, koumyss, minim doses of vinum ipecac., and chloral by the rectum are suitable. Restore and maintain the normal position of the uterus when necessary, and treat the cervix according to any indications which may be present. In grave cases which resist all other treatment,

induce abortion, but *never* without professional consultation.

b. *Acid dyspepsia*, or heart-burn, is common during the *latter part* of pregnancy. Palliation only can be hoped for by the use of carbonate of magnesia, or some other alkaline salt. It ceases after delivery.

c. *Constipation*, from *local pressure* and *defective rectal innervation*, is very common. Beside the usual discomfort which attends a loaded rectum, there is liability to abortion from straining at stool, and to the production of false pains toward the end of pregnancy.

Treatment, if scybalous masses are present, should be by enemata. Mineral waters or a dinner pill are useful.

d. *Diarrhœa* in pregnancy should receive prompt attention, as it may cause abortion. Loose passages from the upper part of the large intestine escaping through a channel in the middle of a loaded rectum constitute a not uncommon disorder, which calls for laxatives, enemata, or both.

RESPIRATION. — *Dyspnœa* and *laryngeal cough*, of reflex nature, occurring at any time in pregnancy call for such remedies as *belladonna*, *acid hydrocyan.*, *morphia*, or *chloral*. In the *latter months*, the enlarged uterus

may greatly embarrass respiration by mechanical pressure. For this avoid any additional pressure by tight clothing.

NERVOUS SYSTEM.—a. *Neuralgia* is common, either of reflex character or from anæmia. Anodynes, tonics, and local sedative applications are useful.

b. *Insomnia* in the latter months may greatly deteriorate strength and cause much suffering. Prompt relief usually attends the employment of the bromides, codeia, or chloral.

c. *Pruritus vulvæ*, resulting from leucorrhœal discharge, or more commonly from irritation of cutaneous nerves by local congestion, is both intolerable and intractable. Some relief can be obtained from liniments containing camphor and chloroform. If of leucorrhœal origin, employ mildly astringent injections with small vaginal tampon to absorb discharge.

d. *Chorea* may be evoked by pregnancy when the patient has had previous similar trouble. General hygiene and sedatives, such as the bromides, are indicated. The condition may be so serious in its consequences upon the general health or mental state as to call for the induction of labor.

e. *Paralyses* are generally of transitory nature, produced by anæmia, hysteria, or uræmia. If possible, the cause should be removed. With labor, recovery usually takes place.

CIRCULATION.—The condition of the blood, previously described as present in pregnancy, favors *palpitation*, *syncope*, and *œdema*. There may be a *nervous element* in the production of the two first conditions, while *mechanical pressure* may aid in causing the latter in some locations. *Iron*, *bitter tonics*, and *rectal injections of blood* are useful.

Hæmorrhoids and *varicose veins* of *labia* and *lower extremities* are common. *Partia* relief only can be obtained before labor. The usual treatment should be resorted to, with measures to obviate pressure from the enlarged uterus. *Operative procedures* to relieve hæmorrhoids should be postponed, if possible, yet are safer in result than prolonged irritation and suffering.

SECRETION AND EXCRETION.—a, *Ptyalism* is rare, and is best treated by *astringent washes*, *tannin lozenges*, and *counter-irritation* over salivary glands.

b. *Retention of urine* occurs in some instances when, late in pregnancy, the child is

low in the pelvis. Urination may be possible in the recumbent or knee-chest position. A broad, abdominal bandage, lifting the uterus, should be worn.

c. *Incontinence of urine* is distressing and irremediable. Local, oleaginous applications will somewhat obviate resulting cutaneous irritation.

d. *Albuminuria*, or the presence of albumen in the urine, is more common in pregnancy than formerly supposed. While always affording reason for watchful care, it is only when present in considerable or increasing amount, with indications of *imperfect elimination of urea*, that serious apprehension should be felt. Albuminuria is more common in the latter months, and in the great majority of cases results from *renal congestion* produced by *interference with return of blood* through the *renal veins* from *pressure of the uterus* upon them. It may be caused also by *pressure on the ureters*, by the *altered blood state*, by *reflex irritation*, by *exposure to cold*, or by *previously existing renal disease*. The earlier symptoms are *œdema of face and extremities*, *nausea* with or without *vomiting*, *occasional headaches*, and *diminished secretion of urine*. Later, we

may have severe and frequent headaches, dim and blurred vision, presence of blood and casts in the urine, and uræmic convulsions and coma. Premature labor sometimes occurs. Albuminuria is more common in *primiparæ* and twin cases.

The treatment of albuminuria, indicating, as it does, more or less imperfect elimination of urea, should be directed to the relief of renal congestion. Diuretics such as *tinct. ferri chlorid.* and *acetate of potassa*; laxatives, preferably the *salines*, and *diaphoretics* should be employed. A natural condition of the skin should be promoted by *bathing* and *inunction*. *Dry cups* and *counter-irritation* over the kidneys are serviceable. A simple diet, with an abundance of milk and an avoidance of an excess of nitrogenous food, *nourishes, acts healthily* on the kidneys, and keeps the formation of urea to the minimum.

When the *subjective* symptoms of partial uræmic poisoning are *prominent* and *persistent*, *induction of labor* may be performed after proper consultation.

UTERUS. *Retroversion* should be reduced by placing the patient in Sims', or the knee-chest position, a suitable pessary being used to keep the fundus from fixation below

the sacral promontory. *Cervical erosions*, if present to a considerable degree, require cleansing and astringent applications. Treatment by the prolonged use of the vaginal douche or tampon is objectionable.

CHAPTER IV.

ABORTION AND PREMATURE LABOR.—DISEASES OF THE OVUM.—EXTRA-UTERINE PREGNANCY.

Abortion is the expulsion of the products of gestation *before* the viable period, *i. e.*, the 7th month.

Premature labor occurs between this time and term. Some writers choose to speak of expulsion of uterine contents before the 4th month as *abortion*; between the 4th and 7th months, as *miscarriage*, and between the 7th month and term as *premature labor*.

Abortion is believed to occur once to every eight or ten term deliveries.

The causes of abortion and premature labor are classified as, *a, external, b, maternal, c, fetal*. A, EXTERNAL are *falls, blows, and the use of the sound, douche, etc.*, as in criminal cases. B, MATERNAL, are *fatigue, emotional excitement, febrile affections,*

albuminuria, syphilis, oxytocics, uterine disorders such as lacerated cervix, adhesions, uterine irritability owing to previous abortions, cellulitis, peritonitis, and reflex irritations as from suckling or inflamed hemorrhoids. C, FETAL, are *syphilis* when contracted through the father, *extravasations of blood* beneath or between the membranes, and *degenerations of fetus or secundines.*

The *immediate* cause, consequent upon some of the conditions mentioned, is partial or general uterine congestion. *Symptoms* are, first, those produced by uterine hyperemia, such as *vesical and rectal irritation, and aching in back and loins*, with bearing-down sensations. *Hemorrhagic discharge and recurrent pain* from uterine contractions follow. Before the stage is reached when regular pains and hemorrhage coexist, abortion may be averted. Before the formation of the placenta—*i. e.*, 3d month—the ovum is usually expelled entire with *unruptured* membranes. Between the 4th and 7th months there is commonly escape of the fetus followed by placenta and *ruptured* membranes. After the 7th month the manner of expulsion resembles that attending term labor. The progress of abortion is ascertained

upon *local examination*. The *earlier* uterine contractions *dilate the cervix* sufficiently to allow the later contractions to *expel* the contents of the uterus.

Prognosis generally favorable. The results may be death from *hemorrhage*, *septicæmia*, or *local inflammations*. These dangers are much greater in criminal than in spontaneous abortion. Chronic uterine disease is a frequent sequence, due more to thoughtless or ignorant *mismanagement* than to abortion itself.

Treatment may be *prophylactic* by doing away with causes such as we fear may produce abortion, with especial caution to avoid fatigue and excitement.

When *symptoms of abortion* are present, its prevention may be accomplished by *absolute rest*, preferably dorsal decubitus with elevation of pelvis by raising the foot of the bed. This should be continued for some days after symptoms subside. *Opium* in moderate, repeated doses is of *great service*; *viburnum prunifolium* has been recommended by some writers. Internal use of hemostatics and external applications are useless, the latter being often promotive of abortion.

If the cervix dilates, pain and hemorrhage continuing, *abortion is inevitable*. To assist

uterine action, give *ergot*. To facilitate cervical dilatation and control hemorrhage, use the *vaginal tampon*, exchanging it for a fresh one every six or eight hours in order to prevent accumulation and decomposition of discharge, and to ascertain the progress of the case. *Examine all the vaginal discharges*, for, by learning their nature, a knowledge of the progress of the case is aided. When cervical dilatation is obtained, if the ovum be not expelled, *introduce and sweep about the finger* to dislodge the uterine contents. In *protracted cases of abortion*, never leave to nature the removal of retained portions of the ovum. If necessary, *dilate the cervix* with *sea-tangle tents* and *remove* the uterine contents with the *finger rather than with instruments*. In cases which have sustained much manipulative treatment, freely employ *anti-septic injections*. After abortion, confine the patient to bed for a week.

MOLES are *retained, degenerated ova* with death of the fetus, the latter event being sometimes the cause, at other times the result.

The carneous mole appears as a firm, fleshy ovoid consisting chiefly of a thick wall produced by hemorrhages into or beneath the

decidua. The blood solidifies, becomes fibrillated and retains its color, thereby suggesting the name, carneous. In the centre of the mass a small cavity is found containing fluid with rarely any trace of fetus. The degeneration commonly *begins* before the 3d month, the mass being discharged between the 3d and 6th months. When retained for a number of weeks, a low form of growth and development occurs.

The fatty mole is nothing more than a carneous mole which has undergone fatty change. It resembles the latter in all respects except that its color has altered from red to yellowish.

The vesicular or hydatidiform mole consists of a collection of vesicles attached to each other and to membranous stalks. The vesicles contain transparent liquid, and vary in size between a small shot and a grape. Essentially a *disease* of the *chorion*, each vesicle is an altered villus. The villi degenerate by proliferation and subsequent liquefaction of their epithelial and connective-tissue cells. If the degeneration is general, as it usually is, the fetus dies, disintegrates, and disappears. The formation of the vesicular mole never *begins* later than the end of the 3d month. The *positive sign* of

the condition is sight of some of the cysts in the vaginal discharge. Suspicions may have been aroused by *uterine growth disproportionate to the period of pregnancy*, and a doughy sensation conveyed to the finger in the vagina. Occasionally the disease primarily affects so small part of the chorion that the fetus continues to develop for a time. Ultimately the mass is expelled.

False moles are collections of blood, mucous membrane, secretions, etc., unconnected with pregnancy, sometimes found in the uterus.

Treatment is to secure removal of the *entire* mass. Hemorrhage, which may be severe, must be guarded against, as in the treatment of abortion.

Other affections of the ovum are *hydramnion*, or great excess of liquor amnii, *placental inflammations*, *degenerations* and *anomalies in form*, *knots in the funis*, and *fetal degenerations and diseases*.

EXTRA-UTERINE PREGNANCY.

Extra-uterine pregnancy is the development of the ovum in some situation outside of the uterine cavity. *Varieties* are: *ovarian*, *tubal*, and *abdominal*. *Ovarian pregnancy*

may arise, *first*, by penetration of spermatozoa into the *unruptured* Graafian follicle followed by fecundation and lack of discharge of the ovum (the possibility of this is denied by some, though confirmed by our knowledge of the lower animals); *second*, spermatozoa may enter through a rent in the follicle, with failure of discharge of the ovum. *Pregnancy* may occur in the *Fallopian tube* so near the *ovary* that, as development proceeds, the original relation of component parts is so lost that it would appear as if—and the pregnancy *practically* is—ovarian. This variety is properly called *tubo-ovarian*. *Tubal pregnancy* may occur in any part of the tube. When occurring at the extremity in the uterine wall, it is called *interstitial*. The varieties of *abdominal pregnancy* are: *a*, *primary*, when the ovum falls into some part of the peritoneal cavity and there develops; and, *b*, *secondary*, when rupture of tubal pregnancy occurs and further development takes place in the abdominal cavity.

Causes of extra-uterine pregnancy are *obstructions* to the passage of the ovum to the uterus, as *flexions* of the Fallopian tube, *extra* or *intra-tubal adhesions*, *mucous* or *polypoid growths*. It more frequently oc-

curs *after* than before the age of thirty, and often after some years of sterility. The corpus luteum is sometimes found in the ovary *opposite* to the tube in which development occurs.

The fetal membranes develop in the usual way in extra-uterine pregnancy, the villi of the chorion penetrating into subjacent tissues. The uterus undergoes slight sympathetic development, with hypertrophic changes in its mucous lining.

Symptoms of tubal pregnancy are those of ordinary pregnancy, except that an *irregular uterine discharge of blood* is common from the beginning, and often *hypogastric pains*. At some time, between the fourth and twelfth weeks, the thinned tube structures rupture. All the *symptoms of shock, hemorrhage, and commencing peritonitis* follow. Frequently the patient dies. Before rupture occurs, a local examination would show the presence of a *growing mass* at one side of the uterus. If the patient survives the rupture, the products of gestation may continue to develop, being surrounded and shut off from the rest of the peritoneal cavity—as in primary abdominal pregnancy—by a gradually thickening, low form of connective tissue. More

frequently, the fetus dies and undergoes some form of degeneration.

Both primary and secondary abdominal gestation may advance to term. Then pseudo-labor occurs, the uterus expels its decidual lining, and the child soon dies. The devitalized products of gestation may remain encysted and quiescent for years, being transformed into adipocere or a calcified mass, or may excite suppuration in adjacent tissues until, after formation of fistulous tracts, they escape in fragments through either the *abdominal wall, bladder, vagina, or bowel*. Months and years may elapse before this slow process of disintegration and elimination is completed, and during this time the patient may suffer, and at the end perhaps die, from blood-poisoning, or from the exhaustion of prolonged suppuration. Women carrying an extra-uterine fetus have been known to pass through succeeding natural pregnancy.

TREATMENT.—The diagnosis of *early tubal pregnancy* having so commonly an element of doubt, *operative procedures* have rarely been instituted. When positive diagnosis has been agreed upon, *abdominal or vaginal section* and removal of the tumor, with ovary and tube of the affected side, as in ovario-

tomy, would be proper. When rupture occurs, the symptoms of collapse and hemorrhage must be met. Possibly, the hitherto untried operation of laparotomy, removal of blood, fetus, etc., with ligature of bleeding vessels, might prove successful.

To destroy the fetus, prevent growth and render the tumor inert, a continuous current of electricity may be passed through it by means of fine needles introduced into the sac. Galvanic shocks, injection of poisonous agents into the sac, and withdrawal of liquor amnii are methods which have been suggested or employed for the same purpose.

Abdominal pregnancy, at or near term with fetus living, may be treated by primary laparotomy. The chief danger is from hæmorrhage, which will best be guarded against by leaving the placenta untouched, to be expelled after natural separation at a period of some days after operation. Cleanliness and anti-septic precautions will do much toward securing favorable results. Secondary operation for removal of fetus, is performed after waiting to observe what channel nature selects for elimination. The measures, which look toward facilitating fetal removal, are

enlarging, or making openings into the cyst by caustics or incision.

PREGNANCY IN ONE HORN OF A DOUBLE UTERUS may occur so as to closely simulate extra-uterine pregnancy. Efforts at differentiation will succeed only after close study of the history, and local signs where there is suspicion of the existence of either condition. The majority of cases of pregnancy in double uterus terminate favorably without unusual treatment.

Extra-uterine pregnancy must be diagnosed from hæmatocele, cellulitis in one broad ligament with or without abscess, ovarian and fibroid tumors.

CHAPTER V.

THE ANATOMY OF THE PELVIS AND FETAL HEAD.—NORMAL LABOR; ITS CLINICAL PHENOMENA AND MECHANISM IN VERTEX CASES.—MANAGEMENT OF NORMAL LABOR.—THE PUERPERAL STATE.

THE PELVIS, composed of the *ossa innominata*, *sacrum*, and *coccyx*, protects from injury

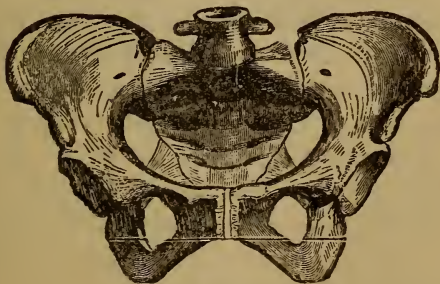


FIG. 25.—Pelvis.

the organs which it supports, and gives attachment to muscles. *The sacrum* is $4\frac{1}{2}$ inches

long, wedge-shaped, having a breadth at the superior portion, or *base*, of $4\frac{1}{2}$ inches. It unites the innominate bones posteriorly, and has upper, anterior, and posterior surfaces, lateral borders, and to its lower extremity is appended the coccyx. Composed of five vertebræ, their union is bony after puberty. Its posterior surface is rough for attachment of muscles and ligaments, and presents foramina for exit of the sacral nerves. The anterior surface is smooth and excavated, forming the *hollow of the sacrum*, its greatest depth, about an inch, being just below the upper border of the third vertebra. The anterior sacral nerves emerging upon this surface may be so pressed upon by the child's head as to produce severe cramp in the muscles of the leg. The anterior surface of the first sacral vertebra, at the upper part, projects and is called the *promontory*. The superior surface articulates with the last lumbar vertebra. The lateral borders, somewhat flaring and approaching each other as they descend toward the coccyx, constitute broad articular surfaces.

The coccyx, attached to the lower end of the sacrum by a joint permitting of motion,

is triangular, apex downward, and composed of four rudimentary vertebræ.

The ossa innominata.—Each bone roughly resembles a figure eight, and consists of three parts, the *ilium*, *ischium* and *pubis* which meet at the acetabulum, forming in early life a Y-shaped, cartilaginous joint.

The ilium has a rough external surface and rounded superior border, the *crest*, to which muscles are attached, and at each extremity of this border are prominences called respectively, *anterior and posterior superior spines*. At a little lower level, separated from these by slight excavations, are smaller projections, called the *anterior and posterior inferior spines*. The greater part of the internal surface presents a concavity called the *iliac fossa*, occupied by muscle. The posterior portion looking backward and inward, articulates with the sacrum. The fossa is bounded below by the *linea ilio-pectinea* with its eminence, which is sharply defined and forms a considerable portion of the *brim* of the true pelvis.

The ischium is the lowest part of the os innominatum, having a *body* which forms a large part of the acetabulum, a large, rough *tuberosity* on which we sit, a *spine* which

projects backward and inward from the lower posterior part of the body, and an *ascending ramus* which passes upward and forward from the tuberosity to the descending ramus of the pubis. The excavated border of the ischium above the spine is called the *greater sciatic notch*, the lesser excavation



FIG. 26.

below the spine being known as the *lesser sciatic notch*.

The pubis is the smallest portion and joins with its fellow of the opposite side to complete the pelvic circumference anteriorly, that part which extends from the point of union to the body being called the *horizontal ramus*, having a small projection, called the *spine*, near

the inner superior border. The *body* constitutes a part of the acetabulum, while the portion which passes from the union of the pubic bones downward and outward to the ischium is the *descending ramus*. This, with its fellow of the opposite side forms the *pubic arch*. The *obturator foramen* is inclosed by the bodies and several rami of the ischium and pubis.

The *symphysis pubis* is the articulation of the pubes, rendered strong by fibrous bands. The articulating surfaces are covered by cartilage which are separated by a small synovial sac.

The *sacro-iliac synchondrosis* is the name of the joint formed by ilium and sacrum, and has cartilaginous plates and synovial sac. The joint is given great strength by ligamentous bands crossing from bone to bone.

During pregnancy the fibro-cartilaginous structures of these joints become succulent and during labor slight motion of them is permitted.

LIGAMENTS. The *posterior sacro iliac ligaments* are of great importance, for by their attachment to the rough, external, posterior surfaces of the ilia and to the posterior surface of the sacrum, they maintain the sacrum

from being depressed from its position by weight of the body. Through them the weight of the trunk is distributed to the ilia and femora.

The greater sacro-sciatic ligament arises from the posterior part of the ilium and the posterior surface and side of the sacrum and coccyx. Converging, the fibres cross to the tuber ischii.

The lesser sacro-sciatic ligament lies anterior to the former, passing from a similar origin on the sacrum and coccyx to the spine of the ischium. These ligaments convert the greater and lesser sciatic notches into foramina.

THE PELVIS AS A WHOLE. The *linea ilio-pectinea* separates the upper portion, or *false pelvis* from the lower, or *true pelvis*, the latter only, being of special obstetric importance, though the flaring ilia of the former form shelves to support the uterus during pregnancy.

The posterior inclined plane of the pelvis is found on either side, being that area situated posterior to a line drawn from the middle of the ilio-pectineal line downward to the spine of the ischium, having a general slope downward, backward, and inward toward the

sacrum and coccyx. The presence of the sacro-sciatic ligaments makes it more extensive.

The *anterior, inclined plane* is that surface anterior to the line mentioned and has a gen-

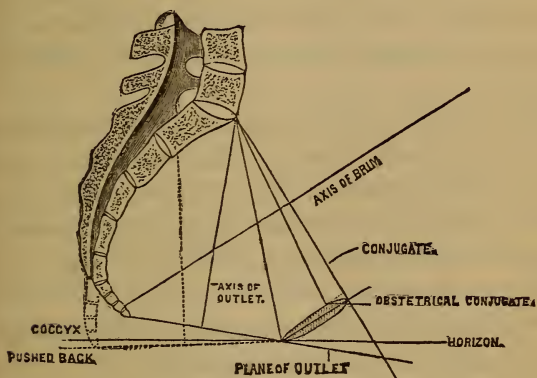


FIG. 27.

eral direction, forward, downward, and inward toward the arch of the pubes.

The upper and lower openings of the *pelvic canal* are termed the *superior* and *inferior straits*, each having a corresponding imaginary *plane*.

With the woman in an erect posture, the angle formed by the plane of the brim with the horizon is 60° ; that of the plane of the outlet

with the horizon, 16° ; that of the plane of the cavity with the horizon, 40° —the promontory of the sacrum being four inches higher than the pubes. The angle formed by the *pubic arch* is 90° to 100° . The depth of the anterior pelvic wall is $1\frac{1}{2}$ in.; the lateral, $3\frac{1}{2}$ in.; the posterior $5\frac{1}{2}$ to 6 in. The *plane* of the *superior strait* is *cordate*, that of the *outlet* being *diamond shaped*.

The *oblique diameters* are lines extending from the sacro-iliac synchondroses to the diagonally opposite ilio-pectineal eminences, that starting from the right synchondrosis being usually called the *right*, that from the left synchondrosis being spoken of as the *left*. The antero-posterior diameter is also called the *conjugate* or the *sacro-pubic*.

Approximate measurements are:

	Antero-posterior.	Oblique.	Transverse.
Brim	4.25 in.	4.75 in.	5.2 in.
Cavity	4.7 “	5.3 “	4.75 “
Outlet	5. “	————	4.25 “

The space between the inner pelvic walls and the contained hollow viscera is occupied by muscular and connective tissue. This lessens the above diameters about quarter of an inch, except the transverse of the brim which

is shortened half an inch, or even more, by the presence of the psoas and iliacus muscles.

External measurements are, between the anterior superior spines of the ilia, 10 inches; between the middle points of the iliac crests, $10\frac{1}{2}$ inches; between the symphysis pubis and spinous process of the lower lumbar vertebra, 7 inches. These have slight importance only.

The axis of the superior strait is a line perpendicular to its plane. If extended, it would touch the umbilicus and tip of the coccyx, and with this the axis of the uterus corresponds. *A line perpendicular* to the plane of the *pelvic outlet* would touch the sacral promontory. This line differs in direction from the axis of the outlet of the *parturient canal* which varies according to the amount of perineal distention.

The female pelvis differs from that of the male in being more spacious and less deep. It is more delicate, having less prominent processes.

THE FETAL HEAD is composed of three principal parts, *i. e.*, the *face*, the *base*, and the *vault*. *Sutures* of importance are the *sagittal*, extending from before backward between the parietal bones; the *frontal*, a continuation of the sagittal which separates the

two halves of the frontal bone; the *lambdoidal* which separates the occipital from the parietal bones: and the *coronal* which separates the frontal from the parietal bones.

The *fontanelles*, two in number, are membranous spaces present at the intersection of the sutures. The *anterior*, called also the *bregma*, is diamond shaped, its four sides being formed by the rounded corners of the two halves of the frontal, and the parietal bones.

The *posterior* fontanelle, at the junction of the two parietal and occipital bones, is triangular and much smaller.

The *sinciput* is the frontal region.

The *vertex* is the highest part of the cranial vault, a region immediately posterior to the anterior fontanelle.

Approximate diameters.

Occipito-frontal.....	4.50 inches.
Occipito-mental... ..	5.30 “
Suboccipito-bregmatic.....	3.50 “
Cervico-bregmatic.....	3.75 “
Fronto-mental.....	3.25 “
Bi-parietal.....	3.75 “

Much change in the form of the head is per-

missible by overlapping of the bones of the cranial vault, at the sutures.

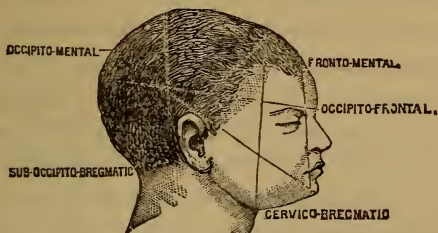


FIG. 28.

NORMAL LABOR, ITS CLINICAL PHENOMENA, AND MECHANISM IN VERTEX CASES.

The immediate cause of labor is, probably, commencing fatty degeneration of the deciduæ. Other causes, accepted by some, are extreme distention of the uterus, a condition of the blood surcharged with carbonic acid, and ovarian stimulation at the end of the ninth month. All such causes act through the nervous system stimulating uterine action to the point of establishing labor.

The preparatory stage occupies one or two weeks preceding labor, the symptoms being sense of fulness about back and hips, not constant, with irregular lancinating pains in

hypogastrium, vesical and rectal irritability, and increased mucous discharge sometimes blood-tinged and then called *a show*. The cause of these symptoms is the settling down of the uterus into the pelvis, and coincident with them there is relief to any existing respiratory trouble. *False pains* produced in a reflex way from pressure of a distended rectum are often mistaken for the pain of the preparatory, and even of the first stage of labor.

Labor is divided into three stages. *The first, or stage of dilatation*, terminates when the cervix has attained that degree of expansion which permits the passage of the fetus. *The second, or stage of expulsion*, continues from the end of the first stage until delivery of the fetus. *The third* is the period occupied in delivery of the placenta and ends when *efficient and safe contraction* of the empty uterus is secured.

Dilatation of the cervix is accomplished by intermittent contractions of the uterine muscular fibres, and the first stage is, therefore, mainly governed by the sympathetic system. This period is much longer than the succeeding stages. At the beginning of labor, uterine contractions, which cause pain in the

ilio-inguinal region or back or in both situations, occur every half-hour. The pains gradually become more severe and frequent, until toward the end of the first stage their frequency is once in five or ten minutes. The uterine action is general from the first, having somewhat more vigor in the highly-developed muscular tissue of the body and fundus. The effect of this general contraction is to cause the uterine contents to seek some outlet and the presence of the cervical opening allows the *liquor amnii*, prevented from escape by unruptured membranes, to specially impinge upon that region as a small dilating wedge. The arrangement of the muscular tissue of this region in *preponderating longitudinal fibres which also contract*, assists dilatation. *Hyperæmia of the cervix* is allowed, owing to absence of surrounding and supporting viscera, which are present at the body and fundus, and this congestion leads to local succulency and softening which greatly facilitate cervical dilatation. As expansion advances, the hydrostatic dilating force of membranes and inclosed liquor amnii acts to greater advantage until they form a most efficient, protruding wedge. As the cervix approaches full dilatation, some re-

traction of it takes place, which expands the upper part of the vagina, already rendered dilatable by hyperæmia and abundant mucous secretion. When the cervix is nearly or wholly expanded, uterine action is usually sufficient to cause rupture of the membranes. Some liquor amnii escapes, but the head quickly descends to occupy the dilated cervix causing retention of the greater part.

The second stage begins after a slight pause, and by the increasing force and frequency of uterine contractions, aided by action of abdominal muscles, the descent of the fetus takes place. The cerebro-spinal nervous system now lends its aid to the sympathetic, the pains are thereby augmented, and they occur with increasing frequency until toward the close of this stage one may occur every two or three minutes. They become bearing down, and are felt over the whole abdomen. The head passes the lower pelvic strait, the perineum is made tense until the vulval opening looks nearly forward and finally the presenting part is born with, in primiparæ, some laceration of the vulval commissures and borders. The body of the child, together with pent up liquor amnii,

quickly follows, usually with the succeeding contraction of the uterus.

Nausea and vomiting during the first, and slight syncope and rigors at the end of the second stage may take place.

The intermittent nature of uterine action is important, as the intervals between pains afford rest to the mother, allow relief to what would otherwise be constant and dangerous pressure of the head upon maternal soft parts, and permit time for the restoration of the equilibrium of the utero-placental circulation.

The third stage. With, or immediately after the birth of the child, the placenta is partly detached, and the uterus contracts upon it as an irregularly globular or flask-shaped body. After a period varying between five and thirty minutes, uterine contraction expels the placenta and membranes with some liquid and coagulated blood which has accumulated in or behind them. Further, undue loss of blood is prevented by closure of uterine sinuses by contraction of the uterine fibres, and formation of coagula in the mouths of the vessels. The uterus remains small, undergoing slight variations in firm-

ness from alternating contraction and relaxation.

Duration of normal labor is longer in primiparæ than in multiparæ, especially when past the age of thirty. The average length for primiparæ is 17, for pluriparæ, 12 hours. The second stage occupies from $\frac{1}{2}$ to 2 hours.

MECHANISM OF LABOR IN VERTEX PRESENTATIONS. *The mechanism* by which the fetus passes through the normal pelvis varies somewhat according to *presentation* and *position* of the child.

By *presentation* we mean that part of the fetus which is touched upon vaginal examination. The *position* is the relation which certain points of the presenting part bear to given points upon the pelvis. Comprehensive knowledge of the mechanism of labor can only be attained by an accurate understanding of the obstetric anatomy of the pelvis and fetus. *Head presentations* occur in 95% of all cases. *The four principal positions* of the head are the *first, or left occipito-anterior* (L. O. A.), in which the *occiput* is situated *anterior*, and behind the *left obturator foramen*, the long diameter of the head being in the right oblique diameter of the

pelvis; *the second, or right occipito-anterior*, (R. O. A.) with the *occiput anterior* behind the *right* obturator foramen, the long diameter of the head lying in the left oblique diameter; *the third, or right occipito-posterior*, (R. O. P.) with the *occiput posterior* against the *right* sacro-iliac joint, the long diameter of the head being in the right oblique line; *the fourth, or left occipito-posterior* (L. O. P), having the fetal *occiput* opposite the *left* sacro-iliac joint, the length of the head being in the left oblique diameter. The first is most common, the second and third of about equal frequency *at the brim*, while the fourth is least common.

The natural position of the fetus is one of general flexion. The spine is convex posteriorly, the arms and thighs against the trunk, the forearms and legs flexed upon the respective limbs, and the chin brought downward toward the chest. When the woman is erect, gravity favors a position of the child with its back anterior, slightly inclined to the left side. The preference which the head shows toward the right oblique diameter is influenced by the presence of the rectum and contents in the left posterior part of the pelvis shortening the left oblique diameter. The

position of the head is determined upon examination, by observing the relative situations in the pelvis of the posterior fontanelle, sagittal and lambdoidal sutures, while the situation and direction of the coronal and frontal sutures, and anterior fontanelle, when they can be reached, aid in diagnosis. The amount of flexion of the head is recognized by the facility with which the anterior fontanelle is reached, the higher the fontanelle, the greater the flexion. In the progress of all vertex presentations, the movements of the head are *flexion*, *descent*, *rotation*, *extension*, and *restitution* or *external rotation*.

THE FIRST OR L. O. A. POSITION. *Flexion* occurs as the vertex engages in the pelvic brim. This substitutes the occipito-bregmatic for the occipito-frontal diameter, being effected by the resistance of the structures about the pelvic brim upon the surface of the anterior part of the head which has a greater area than the surface of the posterior part, the articulation of the head with the body being much nearer the occiput than to the sinciput. After rupture of the membranes, flexion is promoted by the more direct transmission of pressure, through the spinal column upon the posterior part of the head.

The parturient forces acting, *descent of the head* occurs until the occiput is opposite the

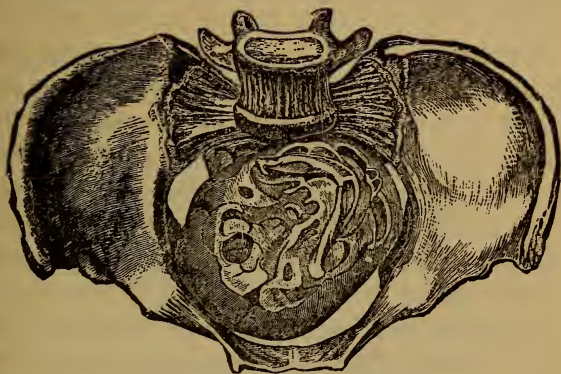


FIG. 29.—First position of vertex.

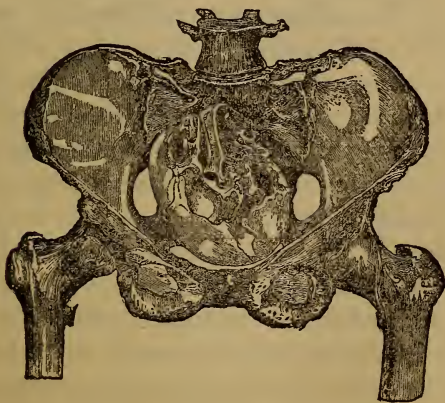


FIG. 30.—Movement of flexion.

lower edge of the obturator foramen, the

forehead being at a much higher level. The right parietal bone is slightly lower than the left.

At this part of the pelvic canal the conjugate diameter exceeds in length the transverse, and *rotation of the occiput* toward the pubes (descent continuing) takes place. The occiput lies on the left anterior inclined surface, the ischial spine directing the sinciput upon the right posterior inclined surface. The head having descended until it encounters the sloping perineal structures, their reflected force causes the occiput to turn toward the pubic symphysis, the sagittal suture being brought to occupy very nearly the antero-posterior diameter.

Descent continuing, the resistance of the perineum maintains flexion of the head until the occiput escapes beneath the pubic arch, the back of the neck lying beneath the bones of the pubic arch.

Extension of the head now occurs, for, as the occiput is fixed, the uterine force acts on the anterior part of the head. The perineum is fully distended, the coccyx is pushed back, the sub-occipito-frontal and sub-occipito-mental diameters pass the outlet of the parturient canal, and the head is born.

As extension occurs, the head is expelled in a downward and forward direction owing to the action of two forces, that of the uterus downward, and that occasioned by the resistance of the perineum, in a forward direction.

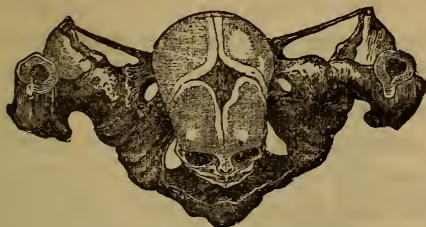


FIG. 31.—Head delivered.

External rotation or restitution. The head now turns toward the right thigh. This is owing to the course which the shoulders take in descending through the pelvis. The head having been born, the shoulders, with their transverse diameter corresponding to the long diameter of the head as far as the mechanism of delivery is concerned, are acted upon by the same influences which govern the behavior of the head in its descent. Their transverse diameter entering in the left oblique line of the pelvis becomes nearly transverse when the head is at the outlet. After birth of the head, the shoulders rotate into the con-

jugate, which is the longest diameter of the outlet, the right shoulder being anterior. This directs the child's face toward the right thigh, causing the head to perform *external rotation*.

The shoulders are next expelled, the left, or posterior, being usually born first. Sometimes they pass simultaneously, or in rare cases the anterior may emerge first. The body and lower extremities immediately follow.

Mechanism in the second or R. O. A. position does not essentially differ from that in the first position. The long diameter of the head is originally in the left oblique diameter of the pelvis. The head descends, the occiput rotating anteriorly, and after birth external rotation turns the face toward the left thigh.

Occipito-posterior positions at the brim (R. O. P., and L. O. P.) become, in the great majority of instances, occipito-anterior positions at the outlet, a *long rotation* occurring which brings the occiput from the sacro-iliac synchondrosis to the pubic arch. The rounded occiput descends until it impinges upon the superjacent structures of the sacro-sciatic ligaments. The sloping surface there encountered tends to turn the occiput toward

the anterior part of the pelvis. If perfect flexion is present, the sinciput will not have descended to the ischial spine of its side, and there is, therefore, nothing to prevent the sinciput from turning posteriorly as the occi-

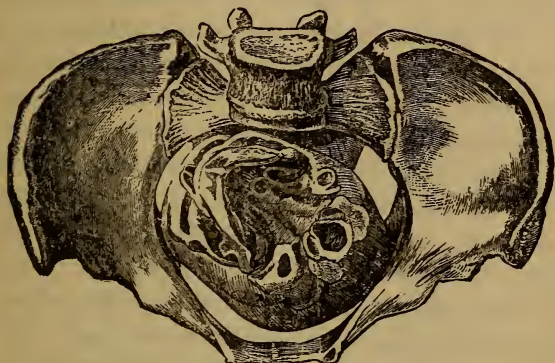


FIG. 32.—Third position.

put rotates anteriorly. *Long rotation* may occur, when flexion is only partial. Then considerable time is required to produce cranial moulding and more complete flexion.

In about five per cent of occipito-posterior cases the occiput fails to perform anterior rotation, and the head is born with the face under the pubic arch. In these cases the perineum sustains great pressure and distention which often leads to extensive rupture. The

occiput being born, the back of the neck is fixed against the centre of the perineum and *extension* occurs, the face sweeping out from beneath the pubes.

Moulding of the head is the alteration and adaptation of its shape to the pelvic canal, permitted by the presence of the sutures.

The caput succedaneum is an oedematous condition of that part of the scalp which lies in the circle of the os, and, after the head passes from the uterus, which lies in the lumen of the vaginal canal. Pressure of resisting structures, on all parts of the head except opposite the opening of the parturient canal, prevents oedema, except at the unsupported part of the scalp opposite that opening.

These phenomena of the mechanism by which the head is born in vertex cases are subject to some modification when the pelvis is very capacious or the head small.

MANAGEMENT OF NATURAL LABOR.

During the two weeks preceding labor, called the *preparatory stage*, advise systematic, moderate exercise and the use of nutritious but digestible food.

The rectum should be emptied daily and, if necessary to secure this, give laxatives such

as the mineral waters, salines, the pil. rhei, or senna. Enemata properly administered are often of great use. Attention to the bowels prevents hæmorrhoids and false pains, and greatly promotes general health and comfort. Clothing should be worn loosely, and restless or disturbed sleep obviated by bromide of potassium or small doses of chloral.

The skin of the nipples may be hardened by daily applications of tannin and glycerine, solutions of borax, or nitrate of lead gr. x. to glycerine $\frac{3}{4}$ i. A happy mental condition should be encouraged.

When summoned to a case of labor attend promptly. By so doing you gain the confidence of the patient, you will always be able to meet the charge of neglect if the child is born before your arrival, or, if labor is but little advanced, you can recognize and may be able correct abnormal conditions, if they exist.

Have at hand a flexible catheter, a preparation of ergot suitable for hypodermic use, chloroform, stimulants, hot and cold water, forceps, needles and silver wire, and hypodermic syringe.

FIRST STAGE. Examine to ascertain degree of dilatation and the character of the os uteri

as to dilatability. Ascertain the presenting part by touching it with the finger introduced through the cervix. If the os will not admit the finger, a vaginal examination of the lower uterine segment will show the presence of a regularly rounded, firm body if the cephalic end of the child presents. The hand depressed in the supra-pubic region, if able to appreciate and grasp this body, confirms the diagnosis. The vaginal examination should be conducted with one or two fingers covered vaseline, without exposure to the patient who lies on her side or back, as the attendant may desire. If the os be not readily perceived, search may be made for it posteriorly, high up toward the sacral promontory. To facilitate the examination, place the hand on the abdomen, pressing the uterus into the pelvis and carrying the fundus backward. Examine in the interval between pains, and again during uterine contraction to ascertain the amount of protrusion of the amniotic bag and whether or not the cervical ring be rigid. Palpation of the abdomen will always assist in diagnosis of presentation and position. Never offer a positive opinion as to the hour of delivery. To ascertain this approximately, note the frequency and force of uterine con-

tractions, the rapidity with which the cervix dilates, the history of previous labor, if the one under consideration is not the first, and the size and relation of fetal head and pelvis. An enema should be given early in labor, for nothing annoys patient and physician more, during the latter part of labor, than fecal accumulation.

Regularity of pains will be promoted by keeping patient out of bed, avoiding, of course, fatigue. At the same time caution the patient to avoid voluntary, straining efforts undertaken with a view to assisting in expulsion. During the first stage they are exhausting as well as useless. When the os is well dilated, if the membranes do not rupture spontaneously, break them with the finger nail, or straightened hairpin.

Until the os is one-half or two-thirds expanded, the attendant may, in most cases, absent himself from the house, watching the progress of the case by returning at intervals of one or two hours.

SECOND STAGE. When the os is dilated, the *position* should be definitely ascertained by noting relation of sutures and fontanelles to each other and to parts of the pelvis. Later,

if the caput succedaneum is formed, it may be impossible to determine the position.

The patient should be allowed to lie down. In some countries the position on the side, with the nates near the edge of the bed, is universally adopted. In this country opinion and custom are divided between the dorsal and the lateral decubitus. Practitioners should accustom themselves to the care of women in either position, and select the one in which labor makes the better progress in each case, being guided somewhat, also, by the inclination and custom of the patient.

She should be judiciously fed occasionally, and be instructed in the manner in which voluntary, muscular efforts can be best applied. *During the pains*, holding the breath and pulling upon some object fixed at arm's length toward the foot of the bed will materially add to the expulsive force. Early in this stage, if pains are infrequent and short, it is well to allow the patient to move about the floor. Vaginal examinations should be made at gradually shortening intervals.

The condition of the bladder should be noted from time to time and the catheter employed if necessary.

MANAGEMENT OF THE PERINEUM, when the

head descends upon it, looks to its *gradual* distention, and the final passage of the head in as *complete a state of flexion* as possible, the *occiput* being *disengaged* from beneath the pubic arch *before* the frontal and facial parts sweep the perineum. If the pains at this stage are very severe and frequent, tell the patient to cease voluntary expulsive efforts. To maintain the proper position of the head during its expulsion and to support the perineum, introduce two fingers into the rectum and draw the perineum forward. This manœuvre, and the pressure of the thumb on the vertex, preventing its too rapid descent, secures complete flexion, while the posterior muscular structures of the perineum are relaxed and brought forward to the strengthening of the anterior and thinner muscular bands. The other hand should at the same time assist in disengaging the occiput from the *pubic arch* and *from the anterior vulval commissure*, and *until this is accomplished* the hand with the fingers in the rectum should not allow the anterior part of the head to pass the perineum. Always avoid direct pressure on the perineum, which, while it does not give support, increases the danger of its in-

jury by stimulating the uterus to greater action.

In occasional *rare* cases, slight lateral incisions may be indicated to avert a deep central tear.

After birth of the head, mucus and blood should be wiped from the nose and mouth and kept from contact with them, lest early respiratory efforts introduce this foreign material into the air passages.

Loosen any coil of funis which may surround the neck, in order that the circulation of the funis may not be interrupted.

Remembering that the passage of the posterior shoulder may cause or increase perineal laceration, direct the shoulders, during their birth, forward toward the pubic arch and make no undue haste in their delivery unless signs of asphyxia are apparent.

The body speedily follows the shoulders, and after the child respire, apply two narrow cords, of suitable strength, tightly around the funis, the first an inch and a half, the second, three inches from the child. Before tightening the first ligature, compress the portion of the funis next the child, in order to displace the gelatine of Wharton from it, as the cord will better undergo subsequent

desiccation. Cut between the ligatures and remove the child. After birth of the head, and during delivery of the body, uterine contraction should be aided by the pressure of the hand upon the partially emptied uterus.

THIRD STAGE. After removal of the child, the hand should be placed upon the fundus uteri and *kept there*. When five to fifteen minutes have elapsed, during which gentle manipulation securing uterine contraction is kept up, if the placenta is not delivered, its detachment and expulsion may be brought about by varied and firm uterine compression with such *slight* traction as will *direct, not withdraw*, the placenta. Pressure should be made downward and backward in the direction of the pelvic brim. Let the placenta emerge slowly, in order that no portions of the membranes be torn off and retained in the uterus.

After the placenta is expelled, pressure and gentle manipulation of the uterus should be *kept up for half to three-quarters of an hour* in order to *expel coagula, to maintain contraction* and to *prevent hæmorrhage*. This close observation of the behavior of the uterus after delivery should be a part of the routine treatment of every case. Ergot

should be given in full dose when the head of the child is born, and repeated if the uterus tends to relax.

After normal uterine contraction has been maintained for the time mentioned, all soiled personal and bed clothing should be removed and a broad abdominal binder applied, its lower border being below the prominences of the trochanters to prevent its displacement upward. This is comfortable to the patient, and by supporting the relaxed abdominal parietes prevents any sudden afflux of blood to the numerous and large vessels of the abdominal cavity which might lead to the unpleasant symptoms of collapse and syncope.

A napkin having been placed between the thighs (not *against* the vulva), if the general and local conditions of the patient are good, the attendant may leave at any time after an hour has elapsed from delivery. He should direct the nurse to frequently inspect the napkin to ascertain regarding the amount of blood discharged, should direct food to be given after the patient has somewhat rested, and insist upon quiet.

THE PUERPERAL STATE.

During the first twenty-four hours after labor, keep the patient from excitement and

promote rest. A mind stimulated by the recollection of the events of labor will not usually permit refreshing sleep, and a single dose of opium, or the use of bromide of potassium is often advisable.

Afterpains, usually absent or slight after the first and second labors, but present in a greater degree after succeeding labors, are painful contractions of the uterus. They will be less liable to occur if the third stage is properly managed. If there be no retained membranes, or coagula, the uterus is less stimulated to this *painful* action. If unavoidably present, morphine in small and repeated administrations is necessary, but not until two or three hours have elapsed, lest a *proper* degree of contraction may fail to occur.

The bladder should be emptied within eight hours after labor. It often happens after confinement that no inclination to urinate is experienced by the patient until the bladder is so distended that it has lost in great measure its contractile power. The catheter should be passed within the time mentioned, if two or three attempts, on the part of the patient, to empty the bladder (the bed-pan being used) are ineffectual. The inability to urinate may depend upon contusion and

swelling of the meatus urinarius. Whenever the catheter has been required, the patient should be encouraged to attempt at regular periods to pass her urine in the natural way, as the continuous use of the catheter may cause cystitis.

The lochia. For several hours after labor, there is a vaginal discharge of blood, rather more in amount than would attend profuse menstruation, which comes from the partially closed utero-placental sinuses, and from slight lesions of the parturient tract. Small coagula having closed the vessels previously laid bare by separation of the placenta, the vaginal discharge diminishes in amount and consists of mucous secretions, decidua, with sanguineous admixture from disintegrating clots. The discharge becomes less bloody and more watery as time advances, until in two or three weeks there is little or none. After it loses the sanguineous appearance it is found to consist of epithelium, mucus, debris of decidua, blood-corpuscles to which are added later fatty particles and pus cells. After it becomes watery there may be reappearance of blood stains owing to accidental dislodgment of some small coagula.

Changes in the uterus. Retrograde meta-

morphosis of the uterus takes place by fatty degeneration of muscular fibres and their absorption. Newly developed muscular fibres begin to appear three or four weeks after labor, and involution—if it proceeds without interruption—is complete at the end of two months. The most rapid reduction in size takes place during the second week. The weight of the uterus after labor is two pounds, at the end of two weeks a little more than three-quarters of a pound, and, at the expiration of six or eight weeks the organ is left more rounded and slightly larger than in the nulliparous woman. Though most of the decidua is thrown off after labor, some remains, which becomes coated with a fibrinous layer at the placental site, and from this a new mucous membrane is developed. *The vagina* undergoes involution in a way similar to the process in the uterus, and its walls undergo contraction, become less flabby, and recover their tone.

The bowels should be moved by a laxative by the third day, and regularity in their function must be promoted thereafter by laxatives or enemata. The first action of the bowels is best secured, usually, by a saline, as considerable relief may be obtained to mammary con-

gestion, which occurs about this time, if the movements be watery. The compound licorice powder is also a valuable cathartic for post-partum purposes.

The utmost cleanliness must be obtained with reference to the patient's person, personal and bed-clothing, attendants, and surroundings. Judicious bathing is *always* proper. The vaginal douche containing some disinfectant, twice each day, is comfortable to the patient, and increases the chances for normal convalescence.

The diet should be unstimulating and nutritious. As the secretion of milk commences, a large amount of liquid should not be introduced into the system—simple, easily digested, solid food being preferable.

Nursing and Care of the Breasts. After labor, unless it is required to stimulate uterine contraction by mammary irritation, defer the application of the child to the breast until the mother has recovered from fatigue. During the first forty-eight hours, the child should be put to the breast every three or four hours, even if there is but little mammary secretion. This practice secures, for the child, good action of the bowels as the result of the excess of colostrum contained in the early secretion.

Furthermore, it enables us to ascertain the capability of the child to suckle, it accustoms the mother to handle her child, it develops the nipples, and causes a *gradual* rather than a sudden acquisition of the mammary function. As the breasts take on their function, do not permit them to become painfully swollen, but apply the child to them, or remove the milk by gentle rubbing of the breasts from periphery toward nipple. If during the forty-eight hours occupied in the development of the function, the breasts do not *once* become "caked," but little trouble will be experienced subsequently. The slight constitutional disturbance which is liable to occur when a large extent of gland structure is suddenly and greatly congested, will be modified by the management described. The nipples should be bathed and dried after each nursing, the danger of excoriation and fissure being thus lessened. The child should not be applied to the breast more frequently than every two hours.

1. Natural Labor.

2. Unnatural labor due to
- Disturbances of Maternal Forces, { Precipitate.
Tedious.
Powerless.
 - Abnormal condition of maternal passages. { Obstructions* in soft parts.
Deformity of Pelvis.
 - Causes pertaining to uterine contents. { Malpresentation.
Multiple pregnancy.
Excessive developm't.
Monsters.
Hydrocephalus.
Premature ossification
Tough membranes.
Dry labor.
Long or short cord.
Multiple presentation.
3. Complicated labor due to
- Hæmorrhage. { Accidental.
Unavoidable.
Post partum.
Secondary.
 - Prolapse of funis.
 - Retention of placenta.
 - Inversion of uterus.
 - Rupture of uterus.
 - Lacerations of cervix and perin'm.
 - Puerperal convulsions.
 - Sudden death of mother.

*Obstructions in soft parts, rigid os, adhesions, cancer, tumors, cystocele, calculus, fæces, hymen, perineum, thrombus, œdema, antepartum hour-glass contraction.

CHAPTER VI.

PRECIPITATE AND TEDIOUS LABORS.—OBSTRUCTIONS IN MATERNAL SOFT PARTS.—DEFORMITY OF THE PELVIS.

PRECIPITATE LABOR is of short duration, characterized by violent and prolonged uterine contractions following in quick succession, at times the condition being one of *tonic* contraction.

Dangers to mother are those of laceration of cervix, rupture of perineum, and even of the uterus, extrusion of the uterus, shock and hæmorrhage from sudden emptying of the uterus, and mental excitement from physical causes, or from lack of conditions suitable to confinement, as in delivery in public places. *Dangers* to child are from asphyxia, if the intervals between uterine contractions are too short to allow of restoration of normal utero-placental circulation, or from injury if delivery occurs in places unprepared for the recep-

tion of the child. Both mother and child are exposed to danger if there be malpresentation and resulting delay.

Causes are a peculiar irritability of the nervous system controlling functions of the generative tract, and roomy pelvis with comparatively small child. Women sometimes possess this peculiarity of temperament by inheritance, and it would be indicated also by nervous excitement at menstruation.

Symptoms. In addition to the overwhelming action of the uterus, the voluntary muscles take upon themselves, in a reflex way, expulsive action quite beyond the volition of the patient.

Treatment may be preventive if a tendency to precipitate labor is known to exist. During the last month of pregnancy, patient should never be far away from home. On occurrence of pain she should seek her bed, and mental excitement should be avoided. When labor of *precipitate character* is established, chloroform will modify the force of uterine and voluntary muscular action.

TEDIOUS LABOR, from irregular uterine force. The immediate cause in most instances is uterine inertia. This may be produced or encouraged by abnormal uterine structure,

over-distention of the uterus by excess of liquor amnii, or by twin pregnancy, misdirected force, want of dilatibility of cervical region, lack of nerve stimulus, as in those enervated by fashionable dissipation, by sedentary habits, by life in warm climates, by frequent child-bearing, by bad morale or melancholia. In labor commencing as normal, partial uterine exhaustion may arise from delay produced by any obstruction, by distended bladder, intestinal disturbance, or emotion.

Tedious labor is characterized by weak pains of short duration. They may occur regularly at long intervals, or the intervals between them may vary irregularly in length. This unrhythmical, inefficient uterine action may be limited to a part of the labor, and may be present in the first or second stage, or throughout both stages.

Symptoms. Delay occurring in the *first stage*, which is under the control of the sympathetic system, may be much protracted without producing exhaustion, though irregular sleeping and eating, with more or less mental annoyance, will bring about sense of fatigue. There is usually anxiety, increasing in multiparæ, and apathy in primiparæ. A

tardy second stage, however, should be watched closely, for after a time the pulse and temperature will slowly rise, and such symptoms as dry or coated tongue, gastric irritability and general restlessness will supervene.

Treatment. Remove, if possible, the cause of the condition. Rupture of membranes in over-distention, straightening the uterus if its axis is not that of the pelvic brim, relieving a distended bladder may be attended by immediate improvement.

If partial or complete inertia uteri be the chief cause of tedious labor, endeavor to rouse the uterus. To do this, use enemata of stimulating character, or of cool water, douche to the cervix, manual irritation or pressure of the uterus through the abdomen, quinine, ergot when labor is *well advanced in the second stage*. Emotional influences may be removed by chloral or chloroform. Failing to remedy the condition by these means, employ instrumental aid according to the stage of labor, as by the Barnes dilators or the force p

POWERLESS LABOR is that condition which may result after a protracted second stage, if instrumental aid is not rendered. It is one of

general prostration with, of necessity, complete inaction of the uterus.

The pulse becomes quick and irritable, tongue dry, temperature elevated, skin dry, and face pinched in expression. There will be mental confusion, delirium, and gastric irritability. The vagina becomes hot and dry. The fetal heart-sounds are feeble or absent.

Prognosis grave for mother and child.

Treatment.—No woman should ever be allowed to reach this condition. When it exists, judicious stimulation, with highly nutritious and concentrated food should be employed until such reaction shall be brought about that operative aid to delivery may be tolerated. Then the child must be delivered while watchful constitutional support is continued. When labor is survived, great care is necessary to avert hemorrhage, to overcome extreme prostration, and to prevent inflammations of pelvic organs and septicæmia.

OBSTRUCTIONS IN MATERNAL SOFT PARTS.

Rigidity of the cervix, most commonly met with when membranes rupture early in labor, may be spasmodic, owing to pressure and irritation of the cervix by the presenting part, or owing to the constitutional peculi-

arity of a nervous or emotional temperament. Rigidity of the cervix may result from a preponderance of fibrous or cicatricial tissue over normal muscular structure. It may result from imperfect dilating action of longitudinal muscular fibres extending upward from their cervical origin. In some cases, when the membranes are intact they may fail to descend to form a dilating pouch, owing to their unusually close adhesion to the lower uterine segment. There may be co-existence of several of these causes. *Examination* may reveal the cervix thick and fleshy, thin with cord-like edge, or nodulated and hard.

Treatment.—When the spasmodic element is noted, use *chloral*, gr. xv. every half-hour until 3 i. has been given, or *morphia*, in doses of gr. $\frac{1}{6}$ every hour or two. *Belladonna* and *atropia*, by local application or injection, have been recommended, but are of doubtful value. *Chloroform* is of some benefit, but for several reasons its use in the first stage of labor is undesirable. *Local measures*, from which to select, are the prolonged *douche to the cervix*, *digital dilatation*, the *water-bags of Barnes*, and the making of several *small incisions*. *Edema of the cervix*, usually affecting the anterior lip, caused by pinching

of the upper part of the cervix between the head of the child and pubic bones, is more common when the woman keeps the dorsal position during the first stage. *Treatment* is to maintain digital pressure on the oedematous cervix.

Carcinoma of the cervix, when an indurated and thickened condition is present, may be a serious obstacle to delivery. The os may be so undilatable as to require *incision of the cervix* and such *obstetric operations* as are necessary when the uterine outlet cannot be rendered sufficiently large to allow of spontaneous passage of the child. Even *Cæsarean section* has been required. *Dangers* to the mother are those attending division of the diseased tissue—notably that of hemorrhage—with the usual dangers of operative procedures. Happily, women afflicted with cancer of the cervix do not often conceive, or, if pregnant, generally abort.

Ante-partum hour-glass contraction of the uterus, though rare, is so difficult to overcome that forceps, version, embryotomy, and even Cæsarean section may be rendered necessary. It is serious in its results to the mother, and more so to the child, causing an impediment to delivery from tetanoid contraction of bun-

dles of transverse or of oblique uterine fibres, which grasp and retain the fetus in utero. *Anæsthetics* have but little relaxing effect. The production of *emesis* is useful, though some of the *obstetric operations* are usually required.

Cicatricial narrowing and closure of the os uteri or of the vagina requires appropriate surgical treatment.

Tumors of the uterus, if polypoid and hanging from the cervix, should be *twisted off* or removed by the *écraseur*. Tumors of the body, usually fibroid, do not often offer serious obstacle to labor other than to interfere with normal uterine action and to predispose to hemorrhage after delivery. Fibroid tumors of the cervical zone should be *pushed upward* out from the pelvis if possible. If this is impossible, they must be removed by *enucleation* or by the *écraseur*.

Cystic tumors of the ovary which cannot be raised out of the pelvic cavity should *always* be punctured if of such size as to offer *any* impediment to labor. In cases where the head can be crowded past without their evacuation, they sustain such bruising as to lead to inflammation and sloughing, which is prone to extend to neighboring tissues and result seriously, if not fatally.

Vaginal cystocele should not be mistaken for a protruding pouch of membranes, a tumor, or an hydrocephalic fetus. No difficulty from the presence of cystocele will be encountered if a *soft male catheter* be used early and often enough to prevent accumulation of urine, and the *empty bladder be pushed above* the child's head. If early attention has not been rendered, and the catheter cannot be passed, *puncture with the aspirator needle* should be performed.

Vesical calculus should be *pushed upward* from the pelvic cavity before the head is allowed to descend. If this cannot be done, *remove* it through the urethra after dilating that canal, or by *vaginal lithotomy*.

Fecal impaction should be recognized and treated as early in labor as possible, enemata or the scoop being employed.

Fibrous hymen should be incised or excised.

Rigidity of the perineum may be owing to unusual thickness of its normal structure, to cicatricial hardness left from former labor, or to spasmodic action of the muscles, in which spasm the levator ani sometimes participates to a marked degree. Though this rigidity rarely seriously obstructs labor,

it may favor rupture of the perineal body when uterine force finally overpowers it. Rigidity will best be overcome by *gradual distention* of the perineum by the alternately descending and receding head.

Chloroform is of great relaxing efficacy. If laceration seems inevitable, *lateral incisions* made with the bistoury may prevent a deep central tear.

Edema of the vulva, generally associated with albuminuria, may be relieved by making numerous *punctures* through the skin which allow the serum to transude.

Hæmatocele, or *blood-tumor* resulting from rupture of some vein of the bulbi vestibuli, or of the adjacent venous conglomerations, may be confined to the labium or may dissect its way in the cellular tissue around the vagina until there be a large mass offering complete obstruction to the exit of the child.

Varicosity of the veins of the labia favor the accident, which is most likely to occur from pressure of the head when near the vulva. If the tumor cannot be reduced in size by *pressure*, it should be *incised*, the *clots turned out*, and immediately after labor every attention given to *prevent hæmorrhage*. *Packing* the cavity, previously occupied by

the hæmatic effusion, with lint soaked in a *solution of liquor ferri subsulphatis* will be necessary. Frequently applied *antiseptic dressings* are very important subsequently.

DEFORMITY OF THE PELVIS.

The pelvis is deformed when one or more of its diameters vary from the normal standard.

Causes may be *congenital*, from *injury*, or from *disease*.

Principal varieties are:—1. Rachitic pelvis, shortened antero-posterior diameter. 2. Mal-acosteon pelvis, shortened transverse diameter. 3. Oblique deformity. 4. Infantile pelvis. 5. Male pelvis. 6. Pelvic exostoses. 7. Pelvis æquabiliter justo-minor. 8. Pelvis æquabiliter justo-major. 9. Pelvis deformed by spinal curvature, flattened sacrum, hip-joint disease, ankylosis at the sacro-iliac joint, or fracture.

Rachitis is a disease of early life attended by irregular softening of the bones chiefly affecting cartilaginous portions by tardy deposit of lime salts. As the disease occurs prior to the common age at which children walk, and leads to more or less postponement of that exercise, the deformity of the pelvis produced by it is such as would be expected

as the result of the constant sitting or recumbent postures. The pelvis being softened in parts and capable of alteration in shape, be-



FIG. 33.—Rachitic pelvis.

comes narrowed in the conjugate diameter from downward pressure of the weight of the body, and there being no counter-pressure by the heads of the femora, the transverse diameter is not narrowed. The transverse diameter may even be slightly increased, for the weight of the body pressing the sacrum forward causes traction on the sacro-iliac ligaments, and, by their insertion in the ilia, the tendency of the pelvis will be to widen laterally. The deformity of the rachitic pelvis is chiefly at the brim.

The figure-of-eight pelvis is usually of rachitic origin and is produced by forward

displacement of the sacrum with backward depression of the pubes caused by traction of the recti muscles.

Osteo-malacia rarely occurs in this country ; it is a disease by which the pelvis is softened after the person affected has the power of locomotion, and therefore pressure of the femora upon the ilia leads to transverse narrowing. *The triangular pelvis* is developed in this way when there is added forward projection of the sacrum from rickets or other cause.

The oblique pelvis may result when osteo-



FIG. 34.—Malacosteon pelvis.

malacia has affected one side of the pelvis more than the other. Another cause for the oblique pelvis is premature ossification of one sacro-iliac joint preventing pelvic develop-

ment of the corresponding side. The growth of the unaffected half of the pelvis carries the symphysis pubis away from the median line toward the opposite side. The sacrum may be depressed by the custom of carrying heavy weights on the shoulders.

Spondylolisthesis consists in a forward projection of the fourth and fifth lumbar vertebræ, and while the pelvis may be normal, the child is prevented from reaching readily the pelvic brim. To allow of this deformity, there must have been previous inflammation and softening of vertebræ and intervening cartilage, to which may have been added the carrying of heavy weights on the shoulders.

The infantile or undeveloped pelvis is one retaining the characteristics of the pelvis of youth. The conjugate is long, in proportion to the transverse diameter, the pubic arch being narrow.

The male or funnel-shaped pelvis, composed of bones heavier and thicker than usual in the female, has a sacrum with but little concavity, and has approximated ischial tuberosities.

Exostoses, osseous tumors, and the callus from former fractures may obstruct the pelvis, or may so press upon the parturient uterus

as to injure its structure and lead to inflammatory softening and rupture.

The pelvis æquabiliter justo-minor is symmetrical, and proportionately contracted in all its diameters. It is found in dwarfs and in those who attain puberty and complete pelvic ossification at an early age. Very early menstruation may excite suspicion of its existence.

The pelvis æquabiliter justo-major is symmetrical with all its diameters increased above the standard.

The flattened pelvis is produced by sinking downward and inward, without tilting, of the sacrum. The narrowing is found, therefore, in the course of the pelvic canal. Compensating increase of the transverse diameter is common.

Transverse narrowing of the pelvic brim is not common and most frequently arises from posterior curvature of the spinal column in the lumbar region.

Anchylosis of both sacro-iliac joints produces a pelvis elongated in the conjugate and diminished in the transverse diameter—the *Robert's pelvis*.

Dangers to mother are from prolonged labor due to mechanical obstruction to delivery,

often favored also by failure of correspondence of the axes of uterus and pelvis, the uterus having commonly an obliquity, because its lower segment cannot settle into the pelvic brim. Danger is increased by *obstetric operations* required to overcome the obstruction to labor, and to correct malpresentations, which are common. *Rupture of the uterus* may occur, owing to prolonged friction of uterine tissue upon some point of bony deformity, and to violent uterine action occasionally met with during nature's attempt to complete parturition. *Sloughing of maternal soft parts* may result from prolonged pressure of the child upon them. *Metritis, parametritis, and perimetritis* often occur.

Dangers to child arise from *compression of its vital parts* during its birth ; from *prolapse of the funis*, which often arises from failure of the presenting part to occupy and fill the the irregular pelvic brim ; and from such *operative procedures* as forceps, version, and craniotomy, which may sacrifice its life. *Depressions of the skull*, which may be permanent, are often caused by some obstructing bony part.

Diagnosis of Pelvic Deformity.—The condition may be suggested by history of injury

or disease affecting the pelvis or other osseous structures, or of previous difficult labors. During pregnancy, early quickening may excite suspicion, contact of the uterus with the abdominal wall occurring at an early period, the uterus being too large to remain in the contracted pelvis. Later in pregnancy, there may be unusual shape of the abdominal tumor produced by its falling greatly forward (pendulous abdomen), or caused by irregular presentations.

Pelvimetry, or the measuring of pelvic diameters, is of service in detecting the greater degrees of deformity, while the presence of lesser degrees may be appreciated, and approximately estimated. External measurements as *accurately* indicating the degrees of contraction of the pelvic cavity are practically valueless. The three diameters to be noted, with their average normal measurements, are: that between the anterior superior spines of the ilia, $10\frac{1}{4}$ inches; that between the crests of the ilia, $11\frac{1}{4}$ inches; and the external conjugate, from a point below the spine of the last lumbar vertebra to the upper anterior border of the symphysis pubis, 8 inches. Any great variation from these figures calls for internal pelvimetry, which is better performed by the

finger in the vagina than by instruments. In a normal pelvis the promontory of the sacrum can be touched with difficulty, or not at all. The *diagonal conjugate* is the diameter from the sacral promontory to the lower border of the symphysis pubis, and if the former point can be reached, this diameter can be measured accurately by the index finger. Deduct $\frac{3}{4}$ of an inch from this, and the conjugate of the brim is known. The transverse and conjugate diameters of the cavity and the outlet, and the angle of the pubic arch can be approximately estimated by the finger. Supra-pelvic examination through relaxed abdominal walls in the non-pregnant woman will materially aid in diagnosis. *Mechanism* by which the head may be born in the equally contracted pelvis differs from the normal in that flexion has to be extreme during the entire passage of the head. In a *rachitic pelvis* the bi-temporal diameter lies in the conjugate of the brim, semi-flexion being present. The parietal bone lying against the anterior pelvic wall remains fixed, and the parturient forces depress the posterior parietal bone past the sacral promontory. The occiput is then depressed until it reaches the plane of the cavity. From

this time the usual movements of the head take place. Other varieties of pelvis produce various deviations from normal mechanism.

Treatment.—When the conjugate of the brim is not less than $3\frac{1}{4}$ inches, employ *forceps or version*, the latter operation being especially suited to cases seen early in labor when the transverse diameter is ample.

Version may deliver a living child when the conjugate is narrowed to $2\frac{3}{4}$ inches, though three inches is the limit usually placed. Choice must be made between *craniotomy*, *laparo-elytrotomy*, *Cæsarean section*, and *Porro's operation* in the degrees of deformity greater than the above, the requirements of each case being studied.

Induction of Premature Labor is a valuable method of treatment when pelvic deformity is previously known to exist. It should be performed at the

30th week when the conjugate is $2\frac{1}{2}$ inches.

33d “ “ “ “ “ 3 “

35th “ “ “ “ “ $3\frac{1}{4}$ “

CHAPTER VII.

UNNATURAL LABOR DUE TO MALPRESENTATIONS, TWINS, AND TO OTHER CONDITIONS PERTAINING TO THE UTERINE CONTENTS.

BREECH PRESENTATIONS.—Under this head are included *knee* and *footling* cases. The breech presents once in 50 labors; the foot once in 100; and the knee once in 1,000.

The principal positions of the breech are the 1st, left sacro-anterior, L. S. A., the sacrum being directed toward the left obturator foramen; 2d, right sacro-anterior, R. S. A., the sacrum toward the right obturator foramen; 3d, right sacro-posterior, R. S. P., the sacrum against the right sacro-iliac joint; 4th, left sacro-posterior, L. S. P., sacrum against the left sacro-iliac joint. In footling and knee cases the sacrum assumes in time one of these four relations to the pelvic parts. The first and second positions (dorso-anterior) are more common than the third and fourth

(dorso-posterior), because the convex back of the child is better adapted to the abdominal parietes than to the projecting bodies of the convex spine. In footling cases the feet and breech are originally situated side by side

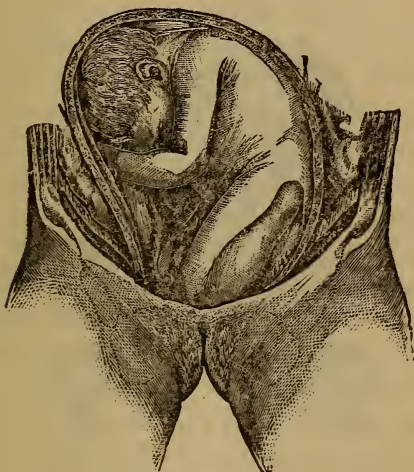


FIG. 35.—Knee Presentation.

in the lower uterine segment, the foot or feet being extended later and presenting at time of labor. The rarity of knee presentation is owing to the fact that an extended thigh makes the fetus embarrassingly long for the uterine cavity.

Causes of breech presentation are excess of liquor amnii, lax uterine walls (easily allowing fetal movements which may substitute the breech for the head), deformed pelvic brim (to which the head may not be well

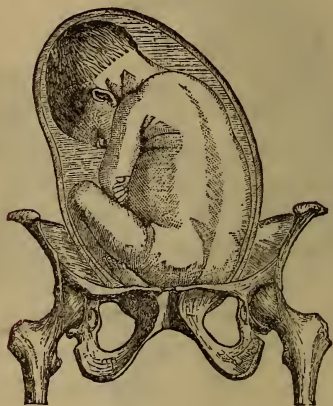


FIG. 36.—Presentation of the breech.

adapted), and *prematurity*, or *death of the fetus*.

Diagnosis.—The membranes, when unruptured, constitute a more cone-shaped pouch than when the head presents. Between the pains, if the fetus can be depressed, and the

finger carried upward—avoidance of undue violence being necessary—the yielding tissue of the buttocks can be felt, the sensation to the finger differing much from that of the firm head. External palpation will reveal the firm, globular head of the child as absent from the supra-pubic region, and present in some part of the fundus uteri. The fetal heart will be heard, usually, at a level with, or above the umbilicus. After rupture of the membranes, the examining finger recognizes the sacrum with its spinous processes, coccyx, the tubera ischii, and intervening cleft with anus. The genital organs can be recognized, it being remembered that the scrotum in a male child may be greatly swollen. The absence of the alveolar ridge excludes the idea of the finger in the mouth, while the presence and escape of meconium assists in the diagnosis. The foot will not be mistaken for the hand if it be remembered that the former is more narrow and thicker, with the toes parallel and in a direct line with the sole. The knee differs from the elbow, in having the patella and two tuberosities with a central depression, the elbow having the prominent olecranon. The shoulder, with which the knee might be con-

founded, has one rounded prominence, with clavicle and spine of scapula in close proximity.

Prognosis to mother is somewhat less favorable than in vertex presentation. One child in six or eight dies. The principal source of danger is from compression of the funis between the pelvic wall and the fetal head, which interrupts the utero-fetal circulation. When this impediment to the circulation is complete for more than two or three minutes, the child will be still-born, as its only supply of aërated blood comes through the funis. In breech cases, the placenta may be compressed between the uterus and the child's head, or may be partially cast off when the size of the uterus is reduced from descent of the buttocks and trunk. In these ways, the supply of oxygenated blood to the fetus may be fatally limited.

Mechanism.—The long diameter of the breech enters the pelvis in one of its oblique diameters, rotating into the conjugate diameter when nearly at the outlet. The anterior hip becomes fixed behind the pubes, and, by a movement similar to extension when the vertex presents, the posterior hip

is born first, to be speedily followed by the other. The body and shoulders descend, the latter entering in the same diameter at first occupied by the breech. If, from needless and hasty interference by the attendant, or from hitching of the arms on bony or soft parts, the arms become extended beside the head, they require to be brought down. The anterior shoulder becoming fixed behind the pubes, that which is posterior is born first.

The head enters the pelvis with its occipito-frontal diameter in the opposite oblique diameter of the pelvis to that previously occupied by the hips. The parturient force acting from above, tends to keep up flexion, and the occiput is the last part delivered. In sacro-posterior cases, a *long rotation* of the head generally occurs, bringing the *occiput* beneath the pubes, this being the situation which it always reaches in sacro-anterior cases. In a comparatively small number of sacro-posterior cases, the head fails to rotate, and the occiput descends in the hollow of the sacrum.

Treatment. — The general principles of treatment are to leave to nature, or even retard, the delivery of the child until a time is reached at which the circulation of the funis

may be embarrassed by pressure of the head; then complete delivery of the child with the utmost speed. By avoiding haste during descent of the buttocks and body, cautioning the patient to refrain from voluntary effort, the parts have time to be dilated and prepared for the passage of the head, and the arms are less likely to ascend.

When the umbilicus reaches the vulva, a loop of funis should be brought to view, examined to ascertain the condition of its circulation, and the ascending portion placed in that part of the pelvis which will be least occupied by the head which is about to descend.

If, as often happens, the arms do not descend with the thorax of the child, but ascend by the sides of the head, the posterior arm should be quickly brought down by the finger of the attendant carrying the arm forward over the side of the child's face. The anterior arm should be released in a similar way. Encourage the patient to make violent bearing down efforts, direct an assistant to make downward manual pressure upon the uterus, and, lifting the child's body forward towards the mother's abdomen, deliver the head. To facilitate this, maintain its flexion

by fingers placed on each side of the child's nose or in its mouth, while the fingers of the other hand press the occiput upward. If there is delay in the escape of the head, mucus and blood should be wiped from the face, and the perineum retracted sufficiently to permit of respiratory acts which may save the child's life. If the head cannot be delivered in the way described, apply the forceps.

Impacted breech cases.—When the breech becomes impacted in the pelvis, bring down one leg, if possible, to lessen the circumference of the presenting part. If this cannot be done, pass a strip of muslin over one leg at the inguinal region and use it to obtain additional traction power. Never use the blunt hook on a living child.

In sacro-posterior cases when anterior rotation of the occiput does not occur, the occiput impinges upon the perineum and usually the face is born first, beneath the pubes. In rare cases the head becomes fully extended and the face is born last. In either event, chiefly in latter, there is greater delay in delivery of the head and much danger of injury to the perineum. Direct the child's body backward toward the mother's sacrum and strive to

maintain flexion of the head upon the thorax during the traction required for delivery.

In footling and knee cases it is especially important that descent should not be hastened lest the maternal parts should be unprepared for passage of the head.

FACE PRESENTATIONS occur once in 230 labors, the condition being one of extreme extension of the head.

Causes, as far as known, which lead to separation of the chin from the chest are:—*unusual length of the posterior part of the head* (dolicho-cephalus), *hitching of the occiput* upon structures at and near the pelvic brim, and *extreme lateral obliquity* of the uterus. If the first of these conditions exists, the latter two causes are more operative. Other lesser causes, such as would prevent good flexion of the head, are coiling of the funis about the neck, or unusually full chest of the child.

In order that uterine obliquity may have an influence in producing face presentation, the child's back must be directed to the side to which the uterus deviates. Face presentations arise at, or a few days before labor.

Varieties.—The four positions of the face at the brim are:—

MENTO-POSTERIOR.

1st Position.

Face in right
oblique diameter.
Forehead to left
foramen ovale.

2d Position.

Face in left
oblique diameter.
Forehead to right
foramen ovale.

MENTO-ANTERIOR.

3d Position.

Face in right
oblique diameter.
Forehead to right
sacro-iliac joint.

4th Position.

Face in left
oblique diameter.
Forehead to left
sacro-iliac joint.

It will be seen that these positions correspond to those of the vertex, the first position being effected by extension of the head where the first position of the vertex had existed, the second position of the face from the second of the vertex, etc. The relative frequency of the positions of the face is still a matter of dispute.

Mechanism.—During labor, no matter what the position may be, in the mechanism of descent, the long diameter of the face corresponds to the long diameter of the vertex, while the chin corresponds to the occiput, the

usual parturient influences being brought to bear during descent and rotation. In the third and fourth positions, the chin undergoes a small degree of rotation, being turned from the foramen ovale, at which it was originally found, to the pubes. In the first and second position the *chin* in the very great majority

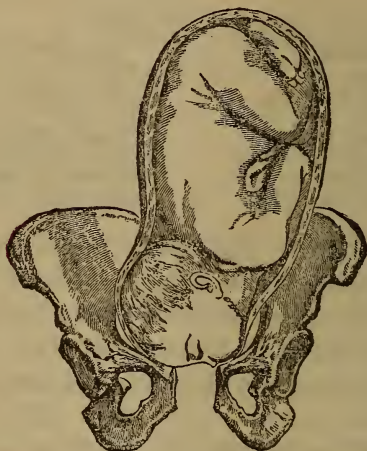


FIG. 37.—Second position in face presentation.

of cases rotates finally beneath the pubes, passing (as is common with the occiput in occipito-posterior vertex cases) from the sacro-iliac synchondrosis, through a *long rotation*.

This may not occur until the chin impinges upon the perineum, or may be effected by the ischial spines which direct the chin forward upon one anterior inclined surface, while the sinciput rotates backward on the posterior



FIG. 38.—Rotation forward of chin.

inclined surface of the opposite side into the hollow of the sacrum.

In rare cases the chin fails to rotate anteriorly, and, if the child is of average size, we will then have to deal with an impaction of the head in the pelvis beyond the possibility of spontaneous delivery. In all face cases, the

first step in the mechanism by which the head passes the pelvic canal is *most complete extension*, while the final delivery of the head from the vulva requires *flexion* before external rotation, or restitution, occurs. The various movements of the head are, therefore, *complete extension, descent, rotation, flexion, and external rotation*.

Diagnosis of face presentation will be made on vaginal examination, by which the parts of the face will be appreciated. The supra-orbital ridges and malar bones will be felt as well as the eye, nose and mouth, the orbits and alveolar ridges resembling nothing connected with the breech. Previous to rupture of membranes, the diagnosis can be made. The presenting part will be found rather high in the pelvis, though readily depressed by supra-pubic pressure.

Prognosis is less favorable than in vertex cases, owing to the increased diameters which have to pass the pelvic canal when the head is in a condition of extension. The mother is exposed to the dangers which attend delayed labor. Prolonged pressure by the head, or its impaction, may produce serious local injuries, such as sloughing, fistula, or lacerations. If descent of the child

occurs with the chin anteriorly, unaided delivery will generally take place, though the mortality to the child is one in ten. The pressure exerted on the vessels of the neck may lead to fatal congestion of the brain. If born alive, the child's face will be greatly disfigured, for a day or two.

When the chin fails to rotate out of the hollow of the sacrum, the child, if of ordinary size, will almost inevitably perish.

Treatment. —During the first stage of labor, carefully avoid rupture of membranes.

In the majority of labors, a stage is reached when we have the os nearly or quite dilated, membranes unruptured, and the presenting part movable at the pelvic brim. Properly applied efforts at this time will easily convert the face into a vertex presentation, in most cases. To do this, give chloroform, pass the hand into the vagina, and with the fingers grasp the occiput and draw it downward. The other hand will give aid by external manipulation. The attempt will sometimes succeed after rupture of the membranes. If the attempt is successful, the case must be watched until after the engagement of the head, for there will be some tendency to a return of the face presentation.

In cases in which labor is advanced, and engagement of the face has taken place, no interference is necessary as long as there is reasonable hope of favorable termination, except that, in mento-posterior cases, there should be an endeavor to accomplish *long rotation* of the chin anteriorly, by aid of the finger which shall either press the chin forward or press the forehead backward and upward, the operator remembering that rotation may occur when the head is quite low in the parturient canal. The forceps may be required to terminate labor.

In mento-posterior cases with no anterior rotation of the chin, forceps or craniotomy will usually be required.

In all examinations and manipulations, care must be taken to avoid injury to the delicate parts of the face.

BROW PRESENTATION is a presentation of the frontal bones, the examining finger being able to appreciate the anterior fontanelle at one border of the cervix, while at the opposite side the orbits and base of the nose may be felt. It is usually converted spontaneously into vertex or face presentation. If it fail to undergo one of these changes, great difficulty will attend delivery, for the *longest* diameter

of the head must pass the several planes of the pelvis.

Treatment may be directed to assist nature in altering the presentation, by upward pressure on either the frontal or parietal part of the head, according as it may seem possible to bring the vertex or the face down to become the presenting part. If seen early, the same manipulation recommended for the management of face cases may be suitable. If brow presentation persists, the forceps and even craniotomy may be required.

MANAGEMENT OF DIFFICULT OCCIPITO-POSTERIOR CASES WHEN THE VERTEX PRESENTS.

—It being remembered that failure of the occiput to rotate anteriorly beneath the pubes is usually owing to incomplete flexion of the head, success will sometimes attend upward digital pressure on the sinciput continued for some time. Long, anterior rotation of the occiput may occur during descent of the head through the pelvis, or even when the perineum is reached, through the influence of the reflected force of the latter. If the forceps is applied to the head in an occipito-posterior position, care should be taken that traction be sufficiently interrupted, occasionally, to ascertain if there be any tendency on the part

of the head to rotate with the occiput forward. If such tendency be discovered, the forceps should be removed and re-applied, in order that the rotation may take place.

TRANSVERSE PRESENTATIONS.—“When the long diameter of the fetus crosses the axis of the uterus, there is produced a transverse, or, after the operation of uterine contractions, a shoulder presentation” (Lusk). Less frequently the arm, hand, side, back, or abdomen may be the presenting part. Transverse presentations occur once in 230 labors.

Varieties, four in number, are *dorso-anterior*, with fetal head to the *right* or to the *left* of the mother; and *dorso-posterior* with head to the *right* or to the *left*. The child lies with its back to the mother's abdomen with *twice* the frequency that it lies with its back toward the mother's spine.

Causes.—*Prematurity and death of child* have an influence, for vital action of the child being feeble or absent, the fetus is less prone to take the usual position in utero to which it is best adapted. *Excess of liquor amnii* and *flabby uterine or abdominal walls* favor cross-births, because the child has greater opportunity to assume any unusual position. When the child is small and premature, there

is always relatively an excess of liquor amnii. *Deformity of the pelvic brim, placenta previa, or tumors* which involve the cervical region, prevent the head from occupying the cervix, and tend to its displacement to one or the other iliac region, bringing the shoulder into the cervix.

Uterine obliquity favors shoulder presentation in the same way. Transverse or oblique position of the fetus will be met with not infrequently in the latter part of pregnancy, which will be spontaneously corrected before labor occurs.

Prognosis depends much upon the time in labor at which a case is seen, as the facility with which the child may be made to change its position to a natural one is much lessened with advanced labor attended by evacuation of liquor amnii and engagement or impaction of the shoulder. In cases seen late the mother is exposed to the constitutional and local dangers of protracted labor, as well as to the dangers of operative measures, which are not inconsiderable, and are often protracted. The mortality to the child is similarly increased, reaching in protracted cases 50 to 75 per cent.

Diagnosis.—Suspicion may be excited early in labor by failure to perceive any presenting

part per vaginam, and recognizing a rounded shape to the protruding bag of waters. Later the examining finger will appreciate beyond doubt the true condition.

The abdomen may be rounded, or broadened with much diminished vertical length. The hard, rounded head may be distinguished elsewhere than in the supra-pubic region, while the breech may be distinguished at some lateral part of the uterus. The recognition of the hand, elbow, shoulder, ribs, or abdomen can be made when the os is half or three-fourths dilated, the differentiation between the first mentioned parts and the foot, heel or breech having already been spoken of. It remains, however, to determine the *exact* position of the child.

If the arm and hand can be examined, remember that when the latter is supine, the palm is directed toward the child's abdomen, and the thumb toward its head. If the arm is in the uterus, in case either the shoulder or side presents, the axillary space can be recognized and is known to be directed toward the breech, while the scapula corresponds to the back of the child and the clavicle to the abdomen.

Natural termination, when the shoulder

presents, takes place in exceptional cases only, and by one of two methods, viz., *spontaneous version*, or *spontaneous expulsion*.

In the first instance—*spontaneous version*—during the pains the shoulder, which has

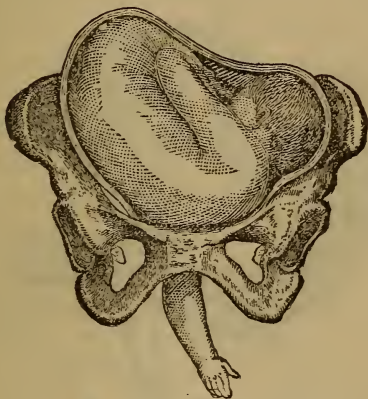


FIG. 39.—Dorso-anterior position.

been presenting, slips upward toward that iliac fossa previously occupied by the child's head, the head at the same time receding. As the shoulder slips up it leaves room for the side, hip and breech to descend, successively to the cervical region, and labor terminates as in breech cases. Less frequently, a reversed order of events may substitute the

head for the side or shoulder, as the presenting part. The phenomena of spontaneous version will be observed only when the presenting shoulder has not become firmly wedged into the pelvic inlet, mobility of the fetus bring essential, propulsion of the fetus

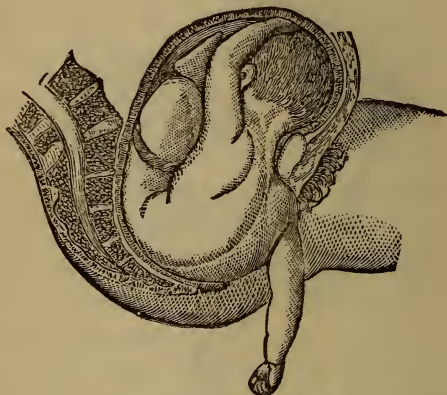


FIG. 40.—Spontaneous expulsion.

being favored by more vigorous contraction of one side of the uterus than of the other.

Spontaneous expulsion occurs with small children who are either dead or feeble, few children surviving who are born by this mechanism. The shoulder descends until it reaches the sub-pubic arch. Its farther descent being prevented by the head which over-

laps the false pelvis, the presenting shoulder remains as a fixed point past which the trunk, breech, and lower extremities are crowded by the force of uterine contractions, the head being the last part born. Dead children are those most liable to this method of delivery as they possess little resiliency of tissues.

Treatment.—In all cases accurately determine the position of the fetus; then, by whatever way that will least involve interference with, or handling of the uterus, alter the presentation to that of vertex or breech. Previous to rupture of the membranes, external manipulation may accomplish version. If labor be farther advanced, and the shoulder fixed at the brim, combined external and internal manipulation, or, failing in this, internal version will be appropriate. If the child in its mal-presentation cannot be dislodged from the pelvis, embryulcia with, in some instances, decapitation will be required.

MULTIPLE PREGNANCY.

Twins occur once in eighty labors; triplets once in 7,000; quadruplets and quintuplets with great rarity, while the uterus has never contained more than five children in any one pregnancy.

Twins may result from impregnation of a double-yelked ovum, or of two ova which may arise from rupture of one or more Graafian follicle. When developed from one ovum, with two centres for fetal growth, we have separate placentæ (though they may be closely adjacent), and we have present in the septum between the amniotic cavities two membranes only, *i. e.*, the two amnions—the chorion and decidua being continuous directly from the surface of one amniotic sac to the other. When two ova are fertilized, each fetus will be entirely surrounded by both amnion and chorion, four membranes being present, therefore, in the septum between the children. When, as is rarely the case, the children are in a common cavity, it is probable that the septum has been destroyed by some accident. There is often an anastomosis of the vessels of the two placentæ.

Most frequently twins consist of a male and a female:—in instances of impregnation of a double-yelked ovum the children are always of the same sex, as they may be, of course, when from two ova. A twin child is of less size and possessed of less constitutional vigor than one born singly, and it often happens that there will be a marked disparity

in size and strength in twin children. Sometimes one child loses its vitality and, though retained in utero until term, will then be found flattened and shrivelled.

There is a well-marked element of heredity in the production of multiple pregnancy.

Diagnosis of twin pregnancy can only be made with certain conviction when two fetal hearts can be heard with different rates of pulsation. The recognition of what appears to be the fetal parts of two children may excite strong suspicion. Excessive size of the uterine tumor is an uncertain sign, as it could depend upon a very large child, or upon excess of liquor amnii.

Peculiarities of labor.—It is not rare to have premature birth. In most cases the dilatation of the cervix and descent of the first child requires more time than the average duration of normal labor. This is because the uterine force, being transmitted to the presenting child through the amniotic fluid and body of the other child, loses much of its strength, and also because over-distention interferes with efficient uterine action.

After birth of the first child there is subsidence of pain for a period varying from half an hour to many hours. When pains again

occur, however, the second child is expeditiously delivered. It is rare for the placenta of the first child to be expelled until both children have been born.

Manner of presentation, as stated by Spiegelberg, is as follows:

Both heads presenting,	. 49	per cent.
Head and breech,	. 31.7	“
Both breech,	. 8.6	“
Head and transverse,	. 6.18	“
Breech and transverse,	. 4.14	“
Both transverse,	. 0.35	“

Locking twins may occur when the first child, having presented by the breech, has its body delivered. Then the head of the second child may descend slightly in advance of that of the first, and may be caught between the chin and thorax of the first child. Head locking may take place when both children present by the vertex, the head of the second child being held between the chin and thorax of the first child. Head locking is uncommon because the separate amniotic sacs prevent the heads from coming in close contact.

Prognosis. — In twin cases one child in thirteen is still-born, danger to the child arising from *prematurity, feebleness, malpre-*

sentation, head locking, and operative measures. The mother is exposed to the dangers of tedious labor, and to hæmorrhage, and septic poisoning, to which there is increased

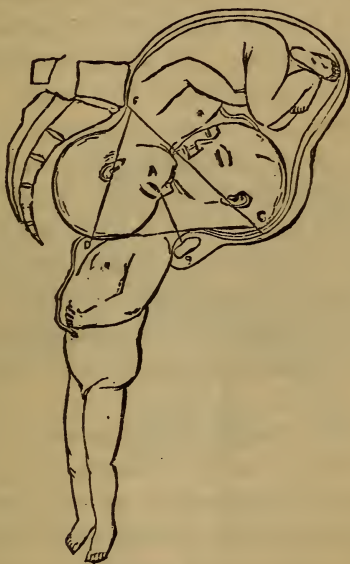


FIG. 41.

facility, owing to the large area left bare after expulsion of placentæ.

Treatment. The placental end of the funis of the first child should be ligated lest, if left to bleed, blood be abstracted from

the circulation of the second child. Traction on the funis of the first child should never be made. The uterus should be encouraged to contract after birth of the first child, and subsequent to the delivery of the children the uterus should be closely watched to prevent hæmorrhage. If head locking occurs, endeavor to disentangle the heads. Failing in this effort, it may be necessary to sacrifice one child by decapitation, and, as the second child is that most likely to be saved in these cases, it is better to decapitate the child which is advancing, removing that part which presents. The second child can then be delivered safely and the remaining part of the child, which presented first, will be born last.

SUPER-FETATION, an occurrence regarded as impossible by some writers, is the impregnation and development of an ovum when the uterus already contains a developing fetus. To make this possible in any given case, there must be ovulation during pregnancy. It is maintained by those who believe it a possible event, that until the end of the second month of gestation the ovum may not reach a size, or be so situated in the uterine cavity as to close both Fallopian tubes, and

that through one of them an opportunity is afforded for an ovule and spermatozoa to meet. Those who oppose this theory explain such cases as present two fetuses of apparently different stages of development, by calling to mind the possibility of pregnancy in a bi-lobed uterus, or of ordinary twin



FIG. 42.—Showing the cavity between the decidua vera and the decidua reflexa during the early months of pregnancy.

pregnancy with arrested development of one child.

SUPER-FECUNDATION is the impregnation of two ova at about the same time, by separate acts of coition, and before the formation of the decidua.

EXCESSIVE FETAL DEVELOPMENT is most apt to occur when one or both parents are of large size, and it is the large size of the child's head rather than its trunk which will occasion serious obstruction to delivery. It will be indicated by failure of the head to engage in the pelvic brim. When the forceps is used, the wide separation of its handles will at once suggest the condition present. Treatment should be the same as that employed when disproportion between the head and pelvis is owing to the latter being of the equally contracted variety.

PREMATURE OSSIFICATION of the fetal head may be associated with excessive size of the fetus, or may exist independent of it. It is more apt to occur in first than in subsequent labors, and can be appreciated by the examining finger. It permits of less than normal moulding of the head. If natural delivery does not occur, the forceps, or even perforation with cephalotripsy, may be required. In women who possess the habit of having children with unyielding heads, the induction of labor should be performed two or three weeks before term, not only in the interest of the child, but as an operation far more safe to

the mother than a difficult forceps operation, or craniotomy.

HYDROCEPHALUS, varying from an increase of intra-cranial contents by a few ounces only, to that which will give a circumference of the head equal to that of an adult, occurs occasionally and offers serious impediment to delivery. The cranial bones are thin and widely separated.

Diagnosis can be based upon perception of the cranial bones, with intervening, fluctuating areas, and recognition of the hairy scalp, proving the part touched to be the head. Differentiation is necessary between this condition and cystic tumors, spina bifida, unruptured membranes, and dead, macerated fetal tissues. The head failing to engage, and forceps, when applied, showing wide divergence of the handles, if the patient be anæsthetized and the hand introduced into the vagina, an accurate diagnosis will be readily obtained. When the breech presents, as is quite common, diagnosis is less easy and will be made only when—the head failing to descend—a careful examination of the case is made.

Prognosis.—Delivery without operative aid is uncommon. Early recognition of the con-

dition and appropriate treatment removes almost all the dangers to the mother which, otherwise, would be those of protracted labor and extensive lacerations of the cervix, vagina, and perineum. The child usually perishes during labor, or dies soon after.

Treatment, whether the child presents by head or breech, is to puncture the head, and allow the fluid to escape. Delivery will then readily occur.

HYDRO-THORAX and HYDRO-PERITONEUM, when offering obstacle to delivery, should be treated by aspiration.

FETAL TUMORS, when of sufficient size to create dystocia, are usually partly cystic, and require similar treatment. Embryotomy may be required.

MONSTERS present three *principal* varieties : 1st, two children which are united either by thorax, abdomen, or some part of the spine ; 2d, a monstrosity having two heads and common trunk and lower extremities ; 3d, a monstrosity having a common head, with separated body, and double lower extremities. Various modifications of these varieties are met with, as well as monsters without the heart (acardiacus), or without the brain (anencephalus).

Prognosis to the mother is generally favorable; to the child very unfavorable. Monsters are apt to be born prematurely, and often perish before the occurrence of labor, thereby losing resiliency of tissues. This explains, in part, the fact that, in fifty per cent of cases, unaided labor will effect delivery.

In the first variety mentioned, one child will be wholly born before the other enters the pelvis. Then the second follows, presenting in a way reverse to that of the first child.

Dicephalous monsters are often born without difficulty. If the breech presents, one head descends in advance of the other. If a head presents, it is delivered followed by the body, the other head being expelled last.

When, as sometimes happens, impaction of the monster takes place, embryotomy will be necessary.

MULTIPLE PRESENTATIONS may complicate labor, as when we have the hand and foot presenting together, or an extremity with the head. Efforts by conjoined manipulation, or by internal version, will usually successfully arrange the fetus in a way to secure delivery.

DORSAL DISPLACEMENT OF THE ARM.—In rare cases, either of head or breech presentation, one arm may be thrown backward, so

that the forearm may lie across the hollow of the neck. This circumstance produces a condition which may offer serious impediment to labor, producing arrest of descent, at a time when least expected. A careful examination, such as should be instituted whenever progress is arrested in the course of labor, will make clear the nature of the obstacle, less readily, however, when the head presents than in breech cases. Liberation of the arm will not be difficult if the child's body be carried backward to make room for the finger of the operator between the pubes and the child's neck.

TOUGH MEMBRANES which fail to rupture when the os is nearly dilated, occasion delay, chiefly because good expulsive pains are not prone to occur until after the discharge of liquor amnii. *Treatment* should be their rupture by the finger-nail, or by whatever may be conveniently at hand. Be careful that the discharge of water be not sudden, through a large rent, lest the funis be carried out in advance of the presenting part.

DRY LABOR—by which is meant labor attended by escape of liquor amnii before the os has attained much, if any, dilatation—is prolonged during the first stage, owing to

the absence of the dilating hydrostatic wedge which is the chief factor in dilatation.

The second stage may then be prolonged, owing to the establishment of partial uterine inertia from the protraction of the first stage. Owing to the prolonged close application of the uterus to the fetus, the life of the latter is sometimes endangered from disturbed utero-placental circulation. *Treatment* should consist of the use of such remedies or methods as will accomplish cervical dilatation (see rigid os), while, at the same time, needed rest and support must be obtained for the patient.

LONG OR SHORT FUNIS. Length of funis may complicate labor by permitting of its prolapse, a condition which will receive consideration on another page. The funis, by being *shorter* than normal or, though long, by being coiled around the neck or body until practically shortened thereby, may create mechanical impediment to delivery, as well as danger to the child from disruption between placenta and uterus, or from undue tension of the cord during descent of the child. If the placenta does not yield to the traction occasioned by a short cord, partial inversion of the uterus may ensue. The funis has been known to be as short as two or three inches. Happily, instances of dangerously short cord are rare.

CHAPTER VIII.

ACCIDENTAL HÆMORRHAGE.—PLACENTA PREVIA.—POST-PARTUM HÆMORRHAGE.—SECONDARY HÆMORRHAGE.

Accidental Hæmorrhage.

This is an escape of blood from the utero-placental circulation, caused by partial separation of a *normally situated* placenta from its attachments.

Varieties of this form of hæmorrhage exist, differing in gravity and in the group of symptoms. Blood may be effused in small amount and, by dissecting its way between the membranes and uterus, appear in the vagina, and the existence of the hæmorrhage be then apparent. Another variety, known as *concealed, internal hæmorrhage*, may present very serious symptoms. In this form, a large quantity of blood accumulates within the uterus, little or none appearing externally.

Hæmorrhage of the kind described receives its distinctive title, "accidental," when it occurs during the last three months of pregnancy. Occurring early in pregnancy, we have simply that condition which is common in abortion, and the small size of the uterus prevents any alarming internal accumulation of blood.

Causes immediately producing the hæmorrhage are irregular contractions of the uterus which disturb the relations of uterine and placental surfaces, or sudden determination of blood to the uterus and placenta. *Traumatism* or *emotion* may provoke these conditions, and—as predisposing to them—we have degenerations of the placenta and such constitutional states as *anæmia*, *syphilis*, or *blood-poisoning* from any source.

Diagnosis. When not of the concealed variety, diagnosis is not difficult, it being of primary importance in these cases to determine that placenta previa does not exist, and this can be determined by digital examination of the cervix, which will determine the presence or absence of the placenta at the cervical orifice.

In concealed hæmorrhage the amount of blood extravasated may be very great. The

situation of the placenta in this condition is likely to be in the upper half of the uterus, and the first extravasation most commonly occurs near the middle of the placenta. Hæmorrhage continuing, the effusion takes that direction in which there is least resistance. If it proceeds in any direction except downward toward the cervix, an enormous amount may be lost from the general circulation without any external loss. When the extravasation is confined by the adherent margin of the placenta, or by the membranes, distention and bulging of the uterus are produced, and even rupture.

Pain is wholly different from that of natural labor. It is cramp-like and constant, and conveys to the patient the idea of extreme tension. It is most severe and agonizing, and is chiefly confined to a circumscribed part of the abdomen. It is an early symptom, but soon there are associated with it symptoms which indicate collapse.

The state of collapse arises in part from loss of blood and in part from shock to the nervous system. It is indicated by the feeble and quickened pulse, pallor and a pinched expression of countenance, coldness of the

surface of the body, shallow respiration, restlessness, and retching.

It will be noted that labor pains are absent or feeble in character. Palpation, under the favoring circumstances of a thin and relaxed abdominal wall, will show in extreme cases distention and irregularity of uterine contour.

Opposite the extravasation an accessory tumor may be present, caused by a bulging of the uterine wall. Not infrequently a discharge of blood or of serous fluid will appear after these symptoms have persisted some time. Serous discharge from the vagina is not the escape of amniotic fluid, but is the watery element of the coagula, which by their compression is forced out.

The rupture of the membranes near the seat of the effusion, and the consequent appearance of blood in the liquor amnii, holds, as a symptom, the lowest rank in the order of frequency (Goodell), because, should the *os uteri* be closed, the membranes, however delicate, cannot, other things being equal, rupture any sooner than the uterine walls, for the sum of resistance of the inclosed liquor amnii, being equally distributed, exactly counterbalances the sum of the pressure exerted by the effusion.

An examination of the uterine contents expelled after the birth of the child reveals the placenta flattened or hollowed on its maternal surface, and a large amount of coagulated blood of varying color and consistence, some being partially decolorized and quite firm.

At the onset of the symptoms the condition of intestinal colic would most resemble that of concealed hæmorrhage. A careful examination of the pregnant uterus, and the occurrence of the more severe symptoms, especially those of loss of blood, would be the means for determining between the two conditions.

When the symptoms of collapse are present, the accident might be mistaken for rupture of the uterus. The history of the case would help us to a diagnosis, in that the former condition occurs prior to or early in labor, while the latter takes place at a later stage. Uterine rupture is attended by retrocession of the presenting part and diminution in the size of the uterus when the fetus has wholly or in part escaped from that organ, and the membranes are relaxed or more commonly ruptured. Concealed hæmorrhage

causes increased size of the uterus, and the membranes are usually entire.

Prognosis in cases of concealed hæmorrhage is that fifty per cent of mothers and nearly all children perish.

Treatment demands exercise of great judgment. In the variety of accidental hæmorrhage attended by the escape of blood from the os, without the occurrence of symptoms of shock, the labor is likely to set in spontaneously and the case terminate favorably—or the hæmorrhage may cease, and pregnancy continue to its natural termination. If in these cases we find the constitutional signs of hæmorrhage persisting, even in slight degree, close attention must be given with a view to assisting in delivery *before* alarming symptoms occur.

The safety of the child is endangered, not only in case of its premature expulsion, but also by loss of blood and injury to the utero-placental circulation. In the grave cases of accidental hæmorrhage there is no safety until after delivery. It must be brought about speedily, while every measure is taken to diminish the hæmorrhage which will be continuing in greater or less degree. No means should be overlooked to rally the wo-

man from the effects of shock and hæmorrhage. Dilatation of the os must be brought about, or aided, by artificial means, Barnes' dilators being most suitable. *Preserve* the membranes unruptured until cervical dilatation is obtained, *thus tamponing* the uterine cavity with liquor amnii.

When the os is dilated version meets the indications better than the forceps, as by the former operation there is less danger from delay during delivery, and because it can be successfully resorted to at an earlier period in dilatation than can the forceps. Bimanual version should not be considered, as in this accident the irregularity of the internal uterine surface caused by the collection of blood would certainly interfere with the change of position of the child.

During the entire time stimulants must be freely used and warmth to the surface, and in exceptional cases, when the hæmorrhage does not appear to be continuing, it is proper to wait for returning vitality before operative measures are undertaken, lest the condition of collapse be aggravated.

The danger is not necessarily over after delivery, for it is often difficult to bring about

reaction from the dangerous condition, and convalescence will often be slow.

PLACENTA PREVIA, *unavoidable hæmorrhage*, occurring once in 570 labors, is an implantation of the placenta so that it wholly or partly covers the internal os. If the cervical opening is entirely covered by the placenta, the condition is termed *placenta centralis*, or *complete placenta previa*. According as the cervical opening is partly covered by, or has its margin in close proximity to the placenta, we use the terms *placenta partialis*, or *marginalis*. If the placenta is within two or three inches of the closed cervix, we are liable to unavoidable hæmorrhage at labor.

Causes are not clear, yet we find the condition most commonly in women who have borne children and have large, relaxed uteri with enlarged cavities.

Clinical history. Doubtless many cases go unrecognized, as abortion is a frequent event when the placenta is previa and will occur often when its cause has not been discovered. In such cases as come under obstetric consideration, we find one or more hæmorrhages taking place at any time during the last four months of pregnancy, most

commonly during the seventh and eighth months. The developmental changes in the cervix and lower uterine segment are the cause for these hæmorrhages, which may, however, be deferred until the occurrence of the changes in the cervix of the preparatory, or first stage of labor. Hæmorrhage may immediately depend upon some exertion, or may come on when the body is at perfect rest owing to some unusually vigorous uterine contraction, it being remembered that rythmical uterine action takes place during the whole of pregnancy. The source of blood is some utero-placental sinus which is ruptured by slight separation of the placenta from the uterus, and as there is but slight disposition to contract on the part of the soft tissues of the cervix, and as there is nothing to check hæmorrhage except the formation of coagula, or lessened force of the circulation, we find the amount of blood to be considerable. The hæmorrhages are generally sudden and painless, quickly filling the vagina with clots.

One hæmorrhage is usually followed by another within a short time, which is due to further separation of the placenta from its attachment. The loss of blood may be fatal when but two or three attacks have occurred,

the most copious hæmorrhages being likely to occur in the beginning of labor. Malpresentations are common, partly owing to the frequency of premature labor and partly because the presence of the placenta in the lower zone of the uterus is apt to displace the head of the child. Unless precautions are taken to prevent hæmorrhage, the patient becomes weak, with all the constitutional signs of loss of blood.

Prognosis is grave. Statistics show mortality to mother of 25 to 33 per cent, while 50 to 75 per cent of children perish. Mothers die from exsanguination, exhaustion, and septicæmia, to which there is liability owing to lowness of placental site and the consequent facility with which thrombi can become detached and germs can be brought to it. It is not uncommon for patients who receive insufficient care to die undelivered. Appropriate treatment will much reduce the mortality.

Diagnosis. The sudden, profuse, and painless character of the hæmorrhage should always arouse a strong suspicion that placenta previa exists, while any discharge of blood in the latter part of pregnancy should lead the medical attendant to employ reason-

able means to clear up the diagnosis. During labor each uterine contraction extends slightly the separation of the placenta, and immediately following the contraction there is a renewal of the hæmorrhage. The discharge of blood during the pain is simply an expulsion of blood already effused, the first effect of the pain being to constrict vessels even though placental separation is increased, actual bleeding taking place in the intervals of contractions.

Vaginal examination when the placenta is previa shows a cervix longer and softer than normal, owing to unusual development caused by increased afflux of blood to the part. The external os is quite patulous. When hæmorrhage has just occurred, a recent clot will be present, usually, in the cervix. This must not be mistaken for the placenta, the latter being distinguished by its fleshy and fibrous character, and, unless partially detached and hanging in the cervix, the placenta will be situated at a higher level than the coagulum. If the placenta be central, the presenting part of the child will not be appreciated through the vaginal part of the uterus. If the placental attachment be marginal, that part of the uterus

which is covered by placenta has a thickened boggy feel, and the presenting part will be distinguished at the opposite side of the cervix. The location of the uterine bruit is valueless as an aid to diagnosis. In a case of central placenta previa I have been able to hear it above the level of the umbilicus only.

Treatment.—*Induction of premature labor* should be performed at any time after viability, when we have had clear indications of the existence of placenta previa. It may be wise in some cases to resort, in the interest of the mother, to this treatment before viability of the child even. When the fetus has reached an age at which it is capable of sustaining extra-uterine existence, induction of labor provides for *its* safety as well, for when depending for life upon a torn and bleeding placenta, its chances for survival are small.

The best way to induce labor is by the use of the *Barnes dilators*, which accomplish, in a brief time, the double purpose of cervical dilatation and direct tamponing of the bleeding surfaces.

If there be a desire to temporize, a *properly applied vaginal tampon* may control hæmorrhage for the time being.

When called to a case of placenta previa in

which the first stage is near, or at completion, obstetrical interference should be such as will most speedily remove the child, while at the same time hæmorrhage be controlled.

If the child is alive, *internal podalic version* will best meet the indications in the *great majority* of cases. *Rupture of the membrae*s should be relied upon only when the *uterine contractions are strong* and the *placenta has marginal attachment*. *Forceps* may be used in the same class of cases, if the uterus fails to cause descent of the head. Delivery by forceps requires considerable time, as the cervix is apt to be long and not widely dilated. The introduction of the blades may be difficult, and even harmful by causing further detachment of the placenta.

Partial separation of the placenta throughout the entire periphery of the cervix (Barnes' method), or the *complete separation and removal* of the placenta in advance of the child (Simpson's method), are measures proper when the child is dead or not viable, or when version would be unwise or difficult.

The conditions which render these methods superior to version are, 1st, a uterus firmly contracted, with entire escape of liquor amnii; 2d, a pelvis so contracted as to make

turning and extraction of the child difficult; 3d, a patient so prostrated as to be unable to bear the operation of version.

POST-PARTUM HÆMORRHAGE.

This may occur either before or after delivery of the placenta, may be slight or severe, and will be met with rarely or frequently according as proper or imperfect attention is bestowed upon lying-in cases. *Causes are deficient, or irregular uterine contraction, and lacerations in the parturient canal.*

Deficient uterine action, or *inertia uteri*, permits the mouths of the veins of the uterus, laid bare by separation of the placenta, to remain open to pour out blood which may escape into the vagina, or which may be obtained by the obstructing presence, in the cervix, of a clot or placental fragment—in the latter case constituting *concealed hæmorrhage*. If the uterus contracts irregularly, the absence of valves in the uterine veins favors hæmorrhage.

Uterine inertia may be produced by the exhaustion of *successive pregnancies, life in tropical climates, prolonged labor, over-distention as from twins or excess of liquor amnii, or by a debilitated constitutional state.* The

completion of *precipitate labor* or of *labor hastened by forceps or version* does not find a uterus which has been gradually roused to the perfection of its function of contraction, and in these cases we are liable to meet with abnormal relaxation.

Irregular uterine action, as when certain bands of muscular fibres contract while others do not, may be a *functional disorder*, may be



FIG. 43.—Irregular contraction of the uterus.

due to *uneven development of the muscular walls of the uterus*, may arise from *retention of placenta or clots*, or be excited by *mismanagement of the third stage of labor*, as when it is attempted to deliver the placenta by *traction upon the cord alone*.

Placental adhesion—not often met with, and for which placental retention is sometimes mistaken—may exist throughout the whole or a part of the surface of the placenta. A part or the whole of the placenta is liable to be retained and, preventing contraction of the uterus, hæmorrhage ensues.

Symptoms.—To the attendant, with hand upon the uterus, it becomes evident, very soon, if there is a disposition to hæmorrhage. If the uterus *relaxes, its fundus rising*, and is with difficulty made to contract, close attention should be given to the vaginal discharge. This may be found considerable in amount, with or without coagula, though there may be absence of hæmorrhagic vaginal discharge while the uterus and vagina are filled with coagula. A suspicion of the existence of *internal hæmorrhage* will be confirmed if on examination the *vagina and cervix are found to contain clots*. The earliest constitutional sign is a *quickenened and weakened pulse*. Speedily following, in the severe cases, are *pallor, cold perspiration, a sensation as if more air was needed, dizziness, restlessness, partial or complete syncope*.

Preventive treatment.—The natural way in which abnormal loss of blood is prevented is

by *complete* emptying of the uterus of clots and secundines, permitting contraction of its muscular fibres, some of which, interlacing, and surrounding the open vessels of the placental site, prevent the escape of blood to any amount. The small amount of blood remaining in the slightly open orifices, coagulates and plugs them up. In the management of labor much can be done to prevent hæmorrhage, by promoting this normal uterine action. To do this, keep the hand continuously upon the uterus from the birth of the child for *half an hour or as much longer as is necessary to secure tonic, uterine contraction*. If the uterus is disposed to relax, gentle, downward and lateral pressure with manipulation is stimulating to it. Do not apply the binder until *permanent, tonic* uterine contraction is obtained. Its presence interferes with necessary observation and treatment of the uterus. If there be manifest tendency to relaxed uterus, examine with the finger in order to detect and remove coagula from the cervix. Give a full dose of ergot when the child is born. It is probable that the delivery of the placenta within five minutes after the birth of the child insures better uterine contraction

than when the uterus is partly distended by it for fifteen or more minutes.

Treatment when hæmorrhage is present.—Empty the uterus of all which it contains, by the introduction of as much of the hand as is necessary. At the same time grasp the uterus, through the abdomen, with the other hand, and compel it to descend and contract. Maintain its contraction by manipulation and downward pressure, adding, if necessary, the stimulus of the other hand, of ice, or of hot water within its cavity. This method of treatment, if *intelligently and persistently* kept up, will rarely fail to accomplish the desired result. Other useful means are *cold to the abdomen*, and *flagellation* with damp towels. *Empty the bladder* if found distended. To the uterine cavity we may apply a continuous stream of *hot water* (110° F.), *vinegar* or *iodine* by sponge or injection, and *sol. ferri subsulph.*, the latter *only when all other means fail*. Hypodermic injections of *ergot*, and the *Faradic current*, one pole at the cervix the other on the abdomen, will be of great use.

When the placenta has not been expelled, it should be *promptly removed*, but with care that no part of it or of the membranes be left

behind. When adherent, the fingers should be gently insinuated between placenta and uterus until removal *en masse* can take place. If, as rarely happens, small portions of the placenta are so firmly adherent that they are, of necessity, left behind, prolonged watchfulness against hæmorrhage will be necessary, with frequently repeated *antiseptic, intra-uterine douches* for days subsequent to labor. During all local treatment, be careful to avoid increasing the already present condition of exhaustion. To restore vitality, apply *warmth to the extremities*, administer *stimulants*, hypodermically at first; later, when absorption by the stomach can take place, by that organ. To prevent cerebral anæmia, *lower the head* of the patient and elevate the foot of the bed. *Compression of the aorta* and *bandaging the extremities* promote the same purpose. *Transfusion* of blood or milk will be proper in extreme cases.

Lacerations of maternal structures, usually of cervix or perineum, may produce hæmorrhage which will be distinguished from the other variety by observing that the uterus is not distended or relaxed. *Pressure, local application of styptics*, or bringing torn surfaces

into apposition by *sutures* will overcome the hæmorrhage.

SECONDARY POST-PARTUM HÆMORRHAGE, occurring later than twenty-four hours after labor, as a grave condition is rare. In lesser degrees it may arise from lacerations and contusions of soft parts, or dislodgment of thrombi from uterine sinuses which may take place at a time when small retained coagula are expelled by post-partum contraction of the uterus. In serious form it will be found associated with separation of an extensive slough, or with septic endometritis. It should be treated by the methods already mentioned, it being permissible in selected cases to employ the vaginal tampon.

CHAPTER IX.

PROLAPSE OF THE FUNIS.—INVERSION OF THE UTERUS.—RUPTURE OF THE UTERUS.—LACERATIONS OF THE CERVIX, VAGINA, AND PERINEUM.—RUPTURE OF PELVIC JOINTS.—PUERPERAL ECLAMPSIA.—THROMBOSIS AND EMBOLISM.—PUERPERAL INSANITY.

PROLAPSE OF THE FUNIS occurs once in two hundred cases of labor, and consists in descent of a part of the cord in advance of the presenting part of the child, either before or after rupture of the membranes. If the membranes have ruptured, while the head is still at the brim, the cord may present at the vulva, coming down laterally or posteriorly.

Causes are excessive length of funis, low implantation of the placenta, such conditions as make easy the recession of the presenting part from the lower uterine segment, as hydramnios and twin pregnancy, and such conditions as prevent the presenting part

from accurately filling the pelvic brim, as *deformity of the pelvis and breech and shoulder presentations*.

Prognosis.—The only danger to the mother arises from operative treatment which may be necessitated. The mortality to the child is more than fifty per cent, the co-existence of head presentations causing greater danger than those of shoulder or breech.

Diagnosis is generally easy. If the loop of funis is felt in the vagina, or seen, no error can arise. Early in labor, when the os is partly dilated and membranes unruptured, the presence or absence of funis presentation can be ascertained unless examination is hasty and incomplete, and the importance of early recognition of the complication cannot be too much emphasized. The funis appears to the finger as a movable, compressible body, unlike anything else which is encountered in this situation; pulsation, if present, facilitating diagnosis. Diagnosis is not complete until it be ascertained whether or not the child is dead. The fetal heart should be listened for, and if not heard and the funis be not pulsating, it will still be necessary to prolong examination, for during uterine contractions the circulation in the

cord may be so much obstructed and so feeble that pulsation cannot be detected, yet following the pains, circulation may be re-established and pulsation be restored. If examination be first made in the interval between pains it should be resumed when the succeeding pain occurs in order to ascertain whether danger is threatened. When still-birth takes place, it is due to interruption of the circulation of the funis from its compression between the pelvic wall and the child during the latter's descent.

Treatment.—If a case be seen early, *carefully guard against rupture of the membranes* by keeping patient in bed. As long as the circulation of the funis is not impeded, there is no imminent danger, and no interference is necessary, though *postural treatment* is proper and often useful at this time. Place the patient on her chest and knees and let her retain this position during several pains, at the same time gently displace the funis from the centre to the margin of the cervix. Gravity will often cause the prolapsed portion of the cord to seek a place toward the fundus uteri. If the method succeeds, it will be necessary to closely watch the case, for prolapse is prone to recur. If the membranes *have rup-*

tured when the case is first seen, and the cord still pulsates, the same treatment should be employed. In all cases when the child is *dead*, no obstetrical aid is needed.

Instruments have been devised for the purpose of conveying the cord into the uterus above the head, and one can be extemporized by passing a tape about the funis and attaching it to the eyelet of an elastic catheter. Such devices will rarely accomplish more than can be gained by the postural treatment. In using them, place the patient on chest and knees, or on the side opposite that at which the funis is prolapsed. If the cord cannot be returned, or, if returned, cannot be kept in the uterus, a selection must be made of the way best suited to each case, by which delivery can be accomplished with but *brief* compression of the cord. If the patient is a multipara, has roomy pelvis, the pains are strong and the head disposed to enter the pelvis, *promote all natural efforts* of labor, or use the *forceps*. If the patient is a primipara and has opposite conditions to those mentioned, employ *version*. Always place the funis, during the passage of the head, in that part of the pelvis in which it would sustain least pressure, and accomplish *rapid* de-

livery of the head. Obstruction of the circulation for more than two or three minutes will usually be fatal.

INVERSION OF THE UTERUS, a partial or complete turning of the uterus inside out, is a very rare event, occurring once in many thousand cases of labor. The inversion may commence at the fundus, or at the cervix.

Causes are spontaneous, irregular contraction, parts of the uterus vigorously contracting while other parts are relaxed; traction on the funis, and improperly applied pressure from above. The accident is most likely to occur when there has been *previous over-distention of the uterus*, or after *hæmorrhage*. The exciting cause may be violent straining efforts. When inversion commences from above, the depressed fundus, acting as a foreign body in the uterine cavity, stimulates active contraction until it is still further depressed and finally extruded. If inversion begins at the relaxed cervix, vigorous contraction of the body and fundus will accomplish the same result. If the placenta be closely adherent to a uterus disposed to irregular contraction, undue traction on the funis by the attendant, or by the fetus if the cord is short, aids in producing inversion.

Diagnosis.—In the beginning of the process it will be observed that the *uterine bulk above the symphysis* is less than usual, and a *cup-shaped depression of the fundus* is sometimes observed. In the greater degree of the accident, little or none of the uterus can be appreciated by supra-pubic examination. Vaginal examination shows the *presence of the inverted fundus*. Co-incident with the local signs are symptoms of *shock*, often reaching an alarming degree, and, if there is a generally relaxed state of the uterus, *hæmorrhage* is present. An extruded polypus will not be mistaken for *inversio uteri* if attention is paid to the local condition, especially if a sound can be made to pass above the former into the uterine cavity.

Prognosis is serious in proportion to the time in which the condition goes unrecognized, or without successful treatment, though spontaneous reduction sometimes occurs. Fatal termination is not rare.

Treatment.—Restore the uterus to its normal condition as speedily as possible. Delay increases the difficulty which attends reduction, and aggravates the state of collapse. Steady the uterus with one hand above the pubes, while with the thumb and fingers of

the other hand grasp and compress the inverted fundus and guide it upward in the axis of the pelvis, with evenly applied force. In some cases pressure applied to the region of one Fallopian tube is more useful. When the placenta is still adherent, it is probably better to remove it before reposition of the uterus, though by some it is advised to return the placenta with the fundus, thus avoiding possible hæmorrhage. Anæsthetics may be necessary. Watch the case closely after reduction, promoting uterine contraction lest inversion recur. The importance of using every means for overcoming shock, is great, for collapse is the cause of death in many cases. When the condition of inversion is overlooked, it may be remedied sometimes, at a period remote from its occurrence, by prolonged pressure on the fundus by means of distended rubber bags kept in the vagina.

RUPTURE OF THE UTERUS.

This accident occurs once in 4,000 cases of labor, and generally begins in the lower uterine segment, extending upward toward but rarely to the fundus. The rent is sometimes oblique, commonly irregular, and rarely transverse. It is called *complete* when it

connects the uterine with the peritoneal cavity, *incomplete* when limited to the muscular or peritoneal envelope.

Causes.—Predisposing to the accident, in the large majority of cases, is *localized degeneration of the uterine parietes*. Most frequently this is a *fatty change*, but may depend upon *malignant infiltration*, or presence of *fibromata*. In consequence, we note that women who have borne many children and are *advanced in life* are most liable. The fact that rupture most commonly begins in the lower uterine segment has been correctly associated with the *thinning of that part of the uterine wall* consequent upon labor prolonged in the second stage. When uterine contractions have continued for some time after cervical dilatation, the muscular fibres become attenuated—the same contractions driving the child forcibly against the uterine wall, which has become little more than membranous. Another cause for rupture of the uterus is *pelvic deformity*, as when abnormal, bony prominences, from long contact with the uterine wall during labor, cause softening and laceration. *Cicatrices* in the uterus, and all conditions, such as *malpresentations*, *hydrocepha-*

lus, or *deformed pelvis* which cause delay in labor, favor the accident.

Symptoms.—In the course of labor there will occur, suddenly, *indications of shock* and *hæmorrhage*, i. e., *rapid and feeble pulse*, *pallor*, *cold skin*, *vomiting*, and *syncope*. *Labor pains cease*, to be instantly followed in many cases by *very severe, constant pain*, with *sensation as if something had given way*. *A vaginal discharge of blood* takes place.

Physical signs vary according to the extent to which the child passes into the abdominal cavity. In a characteristic case, there will be *recession of the presenting part*, *perception of the fetus* readily mapped out through the abdominal wall, and *presence of the globular uterus*, reduced in bulk, at one side of the abdomen. Intestine has been known to appear in the vagina, and in rare cases, emphysema of the cellular tissue of the abdomen. Incomplete rupture affords no typical signs, rapid pulse being of chief prominence, with diminished and disordered uterine action.

Prognosis.—Mortality to mother is 85 per cent, while children almost inevitably perish. Danger to mother arises from *collapse*, *hæmorrhage*, *peritonitis*, and *septicæmia*.

Treatment.—*Prophylaxis* consists in always

guarding against dangerous delay in the second stage of labor. *After* rupture of the uterus, the indications are for removal of child by such means as will lessen the dangers which threaten the mother.

If the fetus is entirely or chiefly in the uterus, it may be removed by the natural outlet either by *forceps* or *version*. The latter operation should be performed by delicate manipulation only, the uterus being steadied by a skilled assistant. In vertex cases, *perforate* rather than make prolonged efforts with the forceps, and during perforation steady the head with the forceps. The placenta must be removed *by the hand*, and, if it has escaped into the abdominal cavity, gentle traction on the cord will bring it within reach. Before leaving the case, make sure that no intestine is in the uterus and liable to strangulation. When the whole or a considerable part of the child has entered the peritoneal cavity, *laparotomy* should be performed, not because the child can be removed most easily by this method, but in order that the removal of all irritating material from contact with the peritoneum can be accomplished. A large number of obstetricians believe that *all* cases of complete rupture should

be thus treated. By no other means can blood, liquor amnii, and vernix caseosa be removed, while the operation permits also of the application of sutures to the uterus, which may control hæmorrhage. Efforts to restore the patient from collapse must be energetic.

LACERATIONS OF THE CERVIX are of common occurrence, and are serious chiefly from the fact that, failing to heal, they prevent normal involution and lay the foundation for many uterine disorders. They are caused by forcible stretching of the cervix by passage of the head, by the finger of the attendant, or by forceps. Œdema of the cervix favors the accident. These lacerations usually correspond in direction to the axis of the parturient canal, though transverse and annular tears may rarely occur. It is a significant fact that during late years, in which the forceps is used often and early, we find laceration of the cervix prominently occupying the attention of gynecologists instead of vesico- and recto-vaginal fistulæ, which we know to arise from too infrequent use of the instrument. Immediate closure with sutures is not regarded as an easy or desirable operation.

LACERATIONS OF THE VAGINA are usually

associated with pelvic deformity, or with lacerations beginning in the uterus. In cases in which they occur, operative treatment is usually inappropriate lest it prolong those conditions which involve shock and exhaustion. The antiseptic, vaginal douche after labor will promote healthy repair.

LACERATION OF THE PERINEUM, an accurate diagnosis of which can be made only upon careful inspection, subsequent to labor, is caused by rapid descent of the head upon an unprepared perineum, by forcible impact of the posterior shoulder of the child, by incomplete flexion of the head, and by failure to secure expulsion of the occipital portion of the head from the anterior vaginal commissure before extension is allowed to take place. The latter is the most common cause of perineal rupture. Immediate closure by sutures should be performed whenever circumstances permit, though a correct appreciation and avoidance of the causes of the accident will do much in its prevention.

RUPTURE OF PELVIC JOINTS.—The pubic articulation is most liable to this accident; the sacro-iliac joint less frequently and to a less degree. It is probable that when these rare events take place there is a succulency to the

joint structures bordering on a morbid state, for we may meet with the accident when labor has easily accomplished the expulsion of a small child through an ample pelvis. The majority of instances are associated with prolonged and violent, though necessary, use of the forceps. Rupture at the sacroiliac joint is partial and produces somewhat vague symptoms, as localized pain and difficult locomotion. Separation at the symphysis pubis prevents locomotion, is attended by exquisite pain and tenderness at the joint, and movements of the pubic bones upon each other can be demonstrated. Recovery is tedious, and will be aided by support of the pelvis by properly adjusted bandages. Many months may elapse before cure.

PUERPERAL ECLAMPSIA.

Puerperal convulsions are associated, in the great majority of cases, with imperfect performance of the renal function, and generally follow certain suggestive premonitory symptoms, though they may occur unexpectedly. Frequency is once in three hundred or four hundred cases of labor.

Causes.—*Predisposing* to eclampsia we may mention a *nervous and excitable temperament*,

while we know that gestation brings about *certain blood charges*, as well as *excitation of the nerve-centres* favorable to the production of nervous disorders. Convulsive seizures may arise—in pregnancy as at other times—from *hysteria, apoplexy, meningitis, poisons of fevers, cholæmia, hydræmia as after hæmorrhage, reflex irritation from the intestinal tract, violent emotion*. Such outbreaks, however, as may be truly called “puerperal,” arise either by: 1st, *irritation of peripheral uterine nerves*, by development of the products of gestation, acting in a *reflex way* upon the *general nervous system* or upon the *nervous system governing the renal function*; or by, 2d, *mechanical interference* of the enlarged uterus with the *return circulation from the kidneys*, or with the *function of the ureters*. Associated with some of the above-mentioned causes, the *immediate* exciting influence will often be some *special irritation of the parturient tract* by the passage of the child, by catheter or forceps, or by hand of the attendant.

Clinical history.—Previous to, and during labor we may observe indications of renal insufficiency leading to more or less uræmic poisoning.

Albuminuria, with attendant symptoms and signs, suggest probable danger, when the circulation is excited as in labor. Shortly preceding a convulsion we often have severe *headache, vertigo, flashes of light, ringing in the ears, nausea, and vomiting*, while *œdema of face, labia majora, and extremities* is generally present. The convulsion—which may come without premonition—resembles that of epilepsy, the muscular twitchings beginning in the face and quickly becoming general. There is frothing at the mouth, venous turgescence of the face, and biting of the tongue. For a period succeeding the fit, varying from a few minutes to half an hour, the patient falls into a somnolent state, and then gradually recovers mental power with no recollection of the circumstances of the attack. There may be no more seizures, or, at varying intervals, with increasing severity, there may occur a great number of fits, even fifty to one hundred. The attack may occur before, during, or after labor, each convulsion lasting one to four minutes. If before, we may expect the speedy advent of labor.

Prognosis always grave to mother and child, the danger being greater according to the time which must elapse before delivery.

Attacks occurring several hours after labor generally terminate favorably.

Post-mortem examination reveals hyperæmia, or degenerative changes in the kidneys, there being no characteristic brain lesion. The ureters and pelves of the kidneys have often been found dilated.

Treatment.—*Prophylactic* measures have been mentioned in a previous part of the book. Treatment during a seizure consists in exercising care lest the patient sustain physical injury. Protect the tongue by introducing a cork or piece of wood between the teeth.

Expedite labor by all measures which will not, at the same time, create too great peripheral irritation. Do not attempt to drag a child through an imperfectly dilated cervix, but by the gentle yet efficient *Barnes' bags* prepare the cervix for the introduction of the forceps or for version. During all operative treatment employ *chloroform*, which not only renders operation more easy, but also lessens disturbance to the nervous system. The *induction of premature labor* in cases which threaten an attack of eclampsia has not shown results sufficiently favorable to warrant its adoption except in extreme cases,

especially those with conspicuous subjective signs.

In all instances of present or threatening eclampsia, call upon the skin and bowels for thorough action. *Diaphoresis* and *catharsis* are efficient in reducing arterial tension, in relieving renal congestion, and, possibly, in eliminating uræmic poison. *Elaterium* or *croton oil* should be freely given, and by external applications of heat, as by *hot blankets and hot bottles*, perspiration induced and *kept up*. *Blood-letting* and *veratrum viride* will have sedative action upon the heart, when needed, and *chloral* in full doses by the mouth or rectum, *morphia* freely given hypodermically, and *chloroform* are useful agents to control the spasms.

The renal disorder, after the convulsions subside, will usually promptly improve without treatment continued for more than a few days. It should always be remembered, however, that chronic nephritis may result.

PUERPERAL THROMBOSIS AND EMBOLISM.

Coagulation of blood in the puerperal patient is favored by the *blood changes with excess of fibrin* induced by pregnancy; by the circulation of *effete material* in the blood

during the degenerative changes in uterine structure attending involution ; and by *weakened circulation* when considerable blood has been lost, the *hæmorrhage* also favoring hyperinosis. *Disintegrating and separated coagula from uterine sinuses* may serve as the starting points from which extensive coagula may form, though spontaneous coagulation is now believed to be possible.

Clinical history varies much according to the situation and size of vessels involved, as well as upon the size of coagula. One class of cases producing very grave and sometimes suddenly fatal results arises from involvement of the *right side of the heart and of the pulmonary arteries*. Such cases may be of spontaneous, or of embolic origin. Usually the occurrence and nature of the complication is quickly and accurately recognized. From a normal puerperal condition there appear all the signs of serious pulmonary embarrassment. The blood fails to be oxygenated. We have *violent dyspnœa, sense of thoracic constriction, gasping breath, pale or livid face, and a countenance indicating extreme suffering*. The heart's action is irregular, usually tumultuous, sometimes fluttering, with radial pulse nearly imperceptible. Physical

examination often reveals *harsh or blowing murmur* over the pulmonary arteries. Death may speedily supervene. In some cases the patient may rally and become more comfortable, only to be quickly attacked again by similar paroxysms, which finally prove fatal. In a small number of instances recovery takes place.

Treatment consists in aiding and steadying the circulation by *ammonia, ether, or brandy*, and requiring complete quiet. If the onset of the attack appears to be safely passed, it must be remembered that slight exertion may cause fatal renewal of the pathological process.

PERIPHERAL VENOUS THROMBOSIS (phlegmasia dolens) is an affection in which we cannot but recognize as an important element in etiology, a blood dyscrasia. That there is a septic element in its *causation* in many cases is also believed. The pathological steps are generally in the following order—thrombus, phlebitis, and, accompanying the latter, inflammation of the lymphatic vessels. Sometimes inflammation of the vein precedes the formation of the thrombus, though, generally speaking, inflammation of the inner wall of the vein in itself does not lead to thrombosis.

The veins most commonly involved in puerperal thrombosis are the *uterine*, *iliac*, and *femoral*, in any or all of which thrombi may be found. The general tendency of such thrombi is to undergo absorption. Fragments may be detached from them, usually when they have existed some time and have become friable. These emboli may lodge in remote organs or parts and occasion further complications.

Clinical history.—The disease begins in most cases between the fifth and eighteenth days after confinement, though instances are met with beginning as late as the end of a month. *Pain, tenderness and stiffness* of the *affected limb* are early symptoms, quickly followed by *swelling*. *Fever* is also present which may have been preceded by *chill*. *Restlessness* and *malaise* are present for a day or two before the local signs appear. *Pulse is accelerated, tongue coated, and bowels constipated*. The swelling of the limb is produced partly by oedema and partly by the obstruction to the lymphatic circulation, the latter making it somewhat *hard* and *brawny*, not pitting much upon pressure. The *pain* may extend from above downward or from below upward. *Tenderness* is marked along the venous

trunks, the femoral and popliteal veins often resembling large, firm cords when felt by the finger. After a week or ten days, the constitutional symptoms begin to subside, though general convalescence is much retarded. The limb also at this time begins to diminish in size, and pain and tenderness gradually disappear. Early efforts to use the limb are always attended by aggravation of all the local symptoms, and it is usually many months before the limb resumes its natural state.

Secondary septicæmia and pyæmia may arise.

Suppuration in the affected limb is a rare result, though superficial ulcers are not uncommon. *Treatment* should be *light and supporting diet, quinine and iron, with anodynes and laxatives* as indicated. *Poultices, warm cotton or flannel, and rendering the limb immovable* in an easy position are required. As the limb begins to improve, warmth and support should be given by *evenly applied bandages of flannel*. Avoid, throughout, any traumatism which might lead to ulcers which are necessarily slow in healing.

Remember, also, that as long as the veins contain any coagula there is the possible danger of detachment of fragments and seri-

ous or even fatal embolism. All exertion should be guarded against for a long period.

PERIPHERAL ARTERIAL EMBOLISM may arise under the peculiar blood conditions of the pregnant and lying-in states, when fibrinous deposits are swept from the valves of the left heart into the circulation. The resulting condition of obstructed circulation in the part affected by the embolus does not call for description here, as it does not differ from that which is non-puerperal.

SUDDEN DEATH from other cases than pulmonary and cardiac thrombosis and embolism may occur as an extremely rare event. Air may enter the circulation after labor through the gaping uterine veins, if, by change of patient's position or by other means, it finds access to the vagina. The alternating contraction and relaxation of the uterus favors its ascent into the uterus to take the place of expelled fluid contents.

The presence of air, in considerable amount, in the circulation leads to fatal cardiac distention and paralysis, or to asphyxia caused by minute air emboli in the small divisions of the pulmonary artery.

Perilous and possibly fatal syncope may arise when there is afflux of blood to the large

vessels of the abdominal viscera after the sudden diminution of uterine bulk consequent upon the birth of the child. A suspension of function of important cerebro-spinal centres results from the withdrawal of blood from them.

PUERPERAL INSANITY.

Under this head are included the various forms of mental derangement which are associated with pregnancy, the puerperal condition, and lactation. *Mania* and *melancholia* are the varieties met with.

Causes, of which several usually co-exist, are *hereditary tendencies*, *anæmia* which may be simply the *altered blood state of pregnancy*, or may arise from *successive pregnancies*, *enfeebling disease* or *hæmorrhage*, *uræmia*, *sudden*, *unusual* or *prolonged excitement* from any cause. Some writers have urged that *septic*, while others that *uræmic* poisoning explained the phenomena, but these claims have not been established. The *depression of spirits of primiparæ*, especially if *unmarried*, not rarely develops into melancholia or prepares the way for mania.

Melancholia is the form of insanity which may occur in pregnancy, and may succeed

(and must be distinguished from) hypochondriacal apprehension of evil on the part of the patient. Perverted morale may be brought about in pregnancy in the same way that unusual tastes or cravings may be developed. Insanity following labor by two or more weeks, and that of lactation is more apt to be melancholia than to be mania. Melancholia differs from mania in being insidious in its development, producing less systemic disturbance, running a longer course (from six months to several years if recovery takes place), being less fatal to life, yet more liable to the establishment of irremediable insanity.

Symptoms. The earlier signs of melancholia are *disturbed sleep, headache, mental depression, with some loss of appetite, and loss of strength.* Next there are slight *delusions* of transitory nature. As these develope, the patient becomes much *dejected, sleeps badly, is disinclined to bodily exercise,* and melancholia becomes established. *Suicidal tendencies* are very common, as well as *disposition to harm the offspring.* The impulse which may sacrifice the mother's, or the child's life, often comes without warning, and closest attention must be given to guard against such an event.

MANIA commonly develops during or before the second week after labor. For two or three days there will be premonitory symptoms such as *restlessness, headache, febrile action, and peculiar behavior*. The patient soon becomes *violent*, displaying an *unexpected and extraordinary amount of strength*. She may remain awake for twelve to eighteen hours raving wildly, and then have a heavy sleep of several hours, awakening only to resume *incoherent, commonly profane and vulgar* language. Thoughts with reference to the sexual organs are common. The *pulse* is *bounding and fast, the temperature high, tongue thickly coated, bowels constipated, urine high colored, and the excitement*, which often prompts the patient to do violence to herself and to persons and objects about her, is *intense*. This may continue for days and weeks, producing more exhaustion upon attendants than upon the patient, or death may occur, prostration and great wasting of the tissues having taken place. The progress of the case will be much influenced by the amount of nourishment taken, for which there is often great disinclination. The fatal result is promoted usually by some co-existing inflammatory condition. When recovery

occurs, it is earlier, more complete, and more permanent than in melancholia.

Upon autopsy, in cases of puerperal insanity, there are no distinctive lesions found.

Treatment.—The *surroundings* of the patient should be *quietly cheerful*, and every means taken to *promote nutrition*. Food must be administered in some way. If left within reach, the patient will sometimes help herself when she refuses it from attendants.

Rectal alimentation is sometimes necessary. *Stimulants* are to be used when exhaustion and debility are present. Sleep must be procured by *chloral* and the *bromides* in full doses. *Hot water* to the head, and *general bathing* have soothing effect. *Opiates* may only be given when all other anodynes fail. In some cases there is present an hysterical element which calls for appropriate moral and medicinal treatment. Active circulatory excitement may be calmed by *aconite*. Blood-letting, blisters, and all depressing measures are contra-indicated. *The bowels* must be looked after, and fecal accumulation and impaction recognized early by abdominal palpation and digital examination per vaginam.

Lactation must cease if that function is being performed. The infant should be re-

moved from the patient's presence, lest it annoy her, its removal seldom exciting any comment from the mother.

The question of home or hospital treatment calls for the use of great judgment to be applied to individual cases. In a general way we may say that mania may more properly be treated at home than melancholia. The circumstances of each case must be studied, especially the character of the patient, and that of friends and attendants. Carelessness or leniency are wholly unsuitable, and every cause for excitement must be removed.

During convalescence, change of scene is very beneficial.

CHAPTER X.

PUERPERAL FEVER.

PUERPERAL FEVER is a term of vague meaning, a relic of the views of earlier days when it was believed that certain serious and fatal illnesses which sometimes follow parturition depended upon a special, zymotic poison. At the present time we are able to classify the various affections, which were formerly included under the general name, under more appropriate titles with a clear understanding of their nature and manifestations, though some minor points in pathology are still unsettled. For convenience we may adopt that classification of Spiegelberg which is chosen by Lusk in his chapters which contain one of the most clear considerations of the subject available to the English-reading student.

The febrile conditions of the lying-in period may be studied as follows:

1. Inflammation of the genital mucous membrane, endocolpitis and endometritis.

a, superficial; *b*, ulcerative.

2. Inflammation of the uterine parenchyma and of the subserous and pelvic cellular tissue.

a, exudation circumscribed.

b, phlegmonous diffused, with lymphangitis and pyæmia (lymphatic form of peritonitis).

3. Inflammation of the peritoneum covering the uterus and its appendages, pelvic peritonitis and diffused peritonitis.

4. Phlebitis uterina and para-uterina with formation of thrombi, embolism, and pyæmia.

5. Pure septicæmia—putrid absorption.

A practical study of the clinical history and pathology of these affections as they present themselves in the puerperal patient leads to the conviction that there is in the vast major-

ity of cases an underlying septic element in their *causation*. In a small proportion of cases, the febrile condition depends in the outset upon some one or more of these *local* conditions, there being no septic poisoning until a later period when the peculiarities of the puerperal patient favor and bring it about. We meet also a few rare instances of these conditions in which we may believe that we have simply the manifestations of local affections from beginning to end. The truth of this would be questioned by some, however, who would regard such cases as presenting the septic element, but in very mild form. Yet I cannot believe that the woman recently delivered may not suffer from cellulitis or peritonitis as well as that these diseases may arise unconnected with child-bearing or septic infection. In *almost every instance*, however, in which we have full facilities for clinical and *pathological* examination, even when organs remote from the parturient tract are the seat of lesions which have caused the fatal result, we are able to discover the indications of the absorption of septic poison at some situation in the genital organs, and the progression of this poison to and into the general circulation,

indications which, in the light of recent and accepted views upon septicemia as a disease, are unmistakable.

The facilities for the introduction and development of septic poison in the lying-in woman are many, while the disease itself has inherent capability of *development* of peculiar intensity. Following parturition we have always the placental site and, in many cases, lacerations of the cervix, vagina, or perineum. If to these surfaces there is the contact of septic material, its absorption is extremely likely to occur. Prolonged contact or bathing of wounds with fluids containing this poison is much more likely to produce septicæmia, and that too of serious character, than contact for a short time, and the anatomical arrangement is such that we find retention of fluids in contact with these absorbing surfaces to be an easy thing. Until a wound is in a healthy, granulating, or a sealed condition, there is increased danger of septic absorption. In all puerperal wounds of the genital tract, their production by pressure, laceration, and bruising causes them to occupy a number of days before reaching a healthy condition of repair. The placental site, too, affords easy ingress to the poison,

owing to the numerous large and often patulous uterine sinuses.

Septic material may be brought in contact with the placental site and with wounds of the vagina in two principal ways, and we may divide our cases, therefore, into *auto-genetic* and *hetero-genetic*.

Auto-genetic cases are those in which the septic poison *originates* with the individual who is sick. They are produced by decomposition of blood, fragments of secundines, inflammatory products, and sloughing tissues which are in close proximity to surfaces capable of septic absorption.

Hetero-genetic cases, or those in which the poison is supplied from other sources than the patient herself, arise from exposure to atmosphere containing emanations from patients suffering from septicæmia, erysipelas, scarlatina, and diphtheria, or from direct contact and inoculation with secretions from such patients, other media than the atmosphere being carriers of the poison. Decomposing animal tissues, pus, and blood also develop the virus of the disease.

The introduction of the poison may be by unclean instruments of all kinds, by unclean hands, or through the air of the sick-room

poisoned by *any* of the agents already mentioned.

Nature and mode of action of the septic poison.—Many and interesting are the studies upon these points, and it would be improper to omit some statement of the more advanced views of pathologists with reference to sepsis. There is so much, however, that is, and must be, speculative, that it seems wise to exercise some conservatism, and not too hastily to accept these views, however ingenious they may be. The power of self-increase of the poison, until from a small amount of the putrid fluid there is extensive production of the contagious principle throughout the whole body has led to the close scrutiny of the component parts of such fluid, and we have learned that there are universally present certain organisms, variably known as bacteria or micrococci. These are regarded as *the contagious principle* by many observers, and it is claimed that they enter the circulation through lesions of the capillaries, veins, and lymphatics, and undergo self-multiplication. The white blood-corpuscles are claimed to be the carriers and disseminators of the micrococci. It is farther known that in cases of septicæmia these organisms are to be found at the presumed

site of inoculation, along the lines of diffusion of the septic poison, in the blood itself, at the seat of the puerperal inflammations of distant organs, as well as in the organs which perform duties of elimination. Accepting this view, rather than that of an essential zymotic poison, affords ready explanation of the *multiform* lesions of puerperal fever, this variation of lesion being chiefly due to the differing grades and extent of lymphatic, or vascular permeation. Another reasonable thought is that there may be variation in the quality and kind of this microscopic poison producing variety of lesion. If, as Lusk has aptly suggested, our best instruments fail to enable us to distinguish the ovum which is to produce a mouse from one that will produce a tiger, though the ovum is at least one hundred times larger than the micrococcus, is it not possible that these septic organisms are not always identical, though they have monotonous appearance of form? This thought is in accord with views expressed by students of the subject. It cannot be doubted that these microspores play some important part in the development of septicæmia, though certain conservative observers are yet unwilling to give them an essential, etiological po-

sition, preferring to regard them as one of the results rather than the cause of the affection. Returning to the classification of Spiegelberg, we have to consider first,

ENDOCOLPITIS AND ENDOMETRITIS. — The simpler forms of these conditions are commonly produced by prolonged or difficult labor, in which the genital tract sustains unusual pressure and irritation from contact with the child. The vagina has superficial erosions and ulcers, giving rise to *considerable purulent and sanguinolent discharge*, exuberant granulations being often found there and on the cervix. This discharge may be *variable in amount*, and *offensive* at times. The *labia* are *swollen*, and there are *pain, tenderness*, and *heat* in the *genital region*. The *uterine cavity* affords discharge containing some *pus* and *blood*, the *uterus* remains *large* and *flabby*, with some *œdema* of the *cervix*. Mild *traumatic fever* continues for a few days until healthy repair is established.

Another form of endocolpitis and endometritis known as *ulcerative, diphtheritic, or septic*, is much more serious. Here we find in the lining of the genital tract, *deep* and *virulent* extension of the *ulceration* until in some cases the deeper muscular structures

are extensively laid bare. The *ulcers* have a *grayish surface*, which, in hospital cases chiefly, sometimes elsewhere, has a membranous character, not differing essentially from that of diphtheria; fibrinous fibrillæ, blood-globules, and micrococci being present. The *discharge is very offensive, brownish, and sero-purulent, containing fragments of necrosed tissue*. These cases may terminate in general septic invasion, or, more commonly, after a febrile condition of a week or more, the ulcers take on a more healthy character, and recovery takes place. The process of healing should be watched in order that *atresia vaginæ* may not result from agglutination of opposed ulcers.

METRITIS.—When the endometrium is inflamed, the subjacent *uterine* structure participates to a greater or less extent in the process. Instances in which the muscular and connective tissues of the uterus are extensively involved are known under the name of metritis, which, as a disease, is never unassociated with some of the other puerperal lesions. *Originating* sometimes from *traumatic* and sometimes from *septic* causes, it occasionally happens that there are not only molecular, but also *necrotic changes*, until a considerable

portion of the structure of the uterus is lost. The earlier condition is one of *œdematous infiltration* of muscular and connective tissue, and the *abundant, lymphatic network* of the uterus takes up active morbid action. *Collections of pus and micrococci* often form in parts of the uterus. The inflammation usually extends to adjacent structures, and blood-poisoning often occurs. The *febrile disturbance* in metritis is of *higher grade* and more prolonged than in endocolpitis and endometritis. Pain is present with offensive *purulent lochia*.

PARAMETRITIS (*pelvic cellulitis*) is the *most common* of the puerperal inflammations, and may be of non-septic or of septic character. In the *former case* the exudation, which may be *localized or general*, is of sero-lymph nature, and the febrile disturbance is simply symptomatic of the inflammatory action, temperature ranging from 101° to 103°, pulse 90 to 120. In the *septic form* there is an *œdematous infiltration*, local or general, in the cellular tissue surrounding the uterus. Micrococci are present in it, and the morbid process can usually be traced from a point or points of inoculation in the uterus along the lymphatics which, as well as the sinuses,

generally contain pus. The febrile action is higher than in the non-septic variety (temperature 103° to 105°), and there is greater constitutional depression as indicated by feeble and rapid pulse (130 to 140), profuse sweats, gastro-intestinal irritability, and nervous prostration.

The local indications of parametritis are pain and tenderness, appreciated by suprapubic and vaginal examination, usually more marked towards one broad ligament than towards the other. There may be diminished or increased and offensive lochia. Any attempt to examine regarding mobility of the uterus is very painful. Urination is slow and painful. If the exudation is general, the examining finger obtains a sensation of fulness and bogginess. If, as often happens, the affection is unilateral, there will be an appreciable firm, tender swelling of circumscribed area. This exudation reaches its greatest extent about the end of the second week. There may be sufficient deposit to be recognizable in the iliac region. Cases may terminate in resolution, the inflammatory mass becoming less tender and smaller, gradually undergoing absorption. Suppuration may occur, the case be much protracted, and ab-

scesses of considerable size may spontaneously discharge in the iliac region, vagina, rectum, or bladder. In all cases we are liable at any time to have *septicæmia* and *pyæmia* as grave and sometimes fatal complications.

PERIMETRITIS (*pelvic peritonitis*) is inflammation of that part of the peritoneum which covers the pelvic viscera. It is often associated with parametritis, owing to proximity of structure, and presents somewhat similar symptoms, though there are certain points of difference in the two diseases. There may be moderate exudation only—sufficient to impair the mobility of the uterus or produce agglutination of surrounding viscera. Occasionally the exudation is abundant, leading to a swelling in the iliac fossa, which may become as large as a good-sized orange, resembling that of cellulitis, though situated at a higher level, and less liable to suppuration. When of septic character, the lines of diffusion from the site of inoculation are apparent on autopsy, the exudation is purulent with presence of small sub-peritoneal abscesses, phlebitis and lymphangitis are present, and the ovaries are commonly inflamed and softened.

Symptoms are fever, pain, tenderness and

tympanites in the hypogastric region, with absence of marked vaginal signs of cellulitis, it being remembered, however, that the conditions are often associated. There may be extension from pelvic to general peritonitis: or the pelvic peritoneal inflammation being secondary to septicæmia, the constitutional disorder may be more marked than the local signs.

GENERAL PERITONITIS is common as a puerperal affection, there being two principal varieties. One form arises as a result of *septicæmia*, there having usually occurred metritis, cellulitis, or pelvic peritonitis, the lymphatics being chiefly engaged in diffusing the poison (peritonitis lymphatica). Another form is primary, or an extension of the pelvic variety, there having been no—apparent at least—preceding septic absorption. In the *septic* form the pain and tenderness which one expects to attend general inflammation of the peritoneum are wholly secondary to the prostration of vital powers due to the blood poisoning. The abdominal cavity will contain fluid, sero-purulent exudation, greenish or brown, and offensive. The intestinal walls are distended, and after death will be found softened and readily torn. The disease

comes on insidiously, sometimes no pain being present of sufficient intensity to require opiates. Similar exudation is often found in the pleura and pericardium associated with septic peritonitis. Loose diarrhoeal movements are not uncommon. The most prominent sign on which to base a diagnosis will be marked, persistent abdominal distention, there being indications of septicemia. There may be no marked septic lesions in the uterus and its appendages.

General peritonitis, when its septic origin is absent or doubtful, affords abundant lymph exudation with some pus. The abdominal organs become agglutinated. The febrile movement is attended by high temperature, severe pain and inflammatory excitement, followed usually by prostration. Vomiting, delirium, tympanites and constipation are common, the latter often followed by diarrhoea. A severe chill is sometimes the initial symptoms of the attack.

SEPTICEMIA is a disease of protean character. It may be of such virulent type that blood dissolution is the only lesion, death occurring before the development of any septic inflammation. In such cases all the organs are softened, and the blood shows

little or no disposition to post-mortem coagulation. The temperature rapidly rises to a high degree (upwards of 106°), extreme nervous prostration occurs, and death may result in from twenty-four to forty-eight hours. If the disease takes a less intense course, though of the same general character, the temperature may continue between 104° and 106° for several days, vomiting, delirium, and sometimes diarrhoea will be present, few patients recovering, the duration of the attack being less than a week.

In other forms of septicemia the blood poisoning is not so virulently felt, though the results may be as serious. The diffusion of the poison is more gradual, its effects are less striking, and the patient may succumb after many weeks of suffering, or finally recover. When purulent infection occurs, the symptoms are clearly demonstrable after the second week. *Chills and profuse sweats recur, the temperature rises and falls, though never reaching normal, the stomach is irritable, the skin becomes yellow, tongue coated and disposed to be dry, low delirium and hallucinations are at times present, the mental faculties are dull, and the respiration is shallow and hastened.* There will be the indi-

cations also of some one or more of the *local, septic inflammations* which have already been described in the preceding pages. *Peritonitis* is present in fewer than half the cases. *Metastatic abscesses*, as the result of the blood changes, or of infected emboli are common in the lungs, kidneys, liver, and about the joints. Hematogenous icterus may occur and is to be regarded as a grave symptom.

PREVENTION AND TREATMENT OF PUERPERAL FEVER. We encounter more cases of puerperal fever in hospital than in private practice, and it is in the former that prophylaxis becomes a question of great moment. An atmosphere uncontaminated by germs such as are developed by surgical cases, and those of zymotic poisoning, as well as by previous cases of puerperal fever, is necessary to the safety of lying-in patients. Inasmuch as the poison can be conveyed from place to place, physician, nurse, laundress, and visitors to the sick-room should exercise great care lest they be the bearers. Bedding, clothing of attendants, hair and whiskers, instruments, hands, and especially finger nails are the media by which the poison may be conveyed to the patient. In prolonged labors it is

necessary—in all cases proper—to employ disinfectant vaginal injections *during* labor. *After* labor and *in advance* of septic indications, their not too frequent but judicious use is called for. The proper management of the third stage of labor, looking to the complete expulsion of secundines and clots, and to permanent, uterine contraction, is important in the prevention of both auto and hetero-inoculation.

In puerperal disorders which, in their inception, are not complicated by septicemia, treatment does not differ essentially from that suited to cases of the same nature unconnected with parturition, except that special care is necessary, on account of the tendencies of lying-in women, to use the *disinfectant douche*, and to *promote escape of pus from mucous surfaces and from abscess cavities*. In cases of septicæmia, by the same means we avoid accumulation of the poison germs and *re-infection*. When the point of inoculation is in the uterine cavity, or when we know that this cavity contains decomposing fluid, warm and carbolized intra-uterine injections should be repeated every few hours, and they will usually cause prompt fall of temperature. Care is necessary that the injections be made

slowly and the liquid be freely allowed to escape so as to avoid dangerous uterine distention, extension of the fluid into the peritoneal cavity, shock, and retention of poisonous material.

Sloughing tissues should be removed as early as possible, and contiguous, exposed surfaces should be covered with *iodoform* in powder form or suspended in glycerin, in a ten-per-cent mixture, or touched with *carbolic acid*, or with *tincture of iodine*.

In local or general parametritis the *early* use of *leeches* may lessen the extent of inflammation. When exudation is present, *vaginal injections* of *hot water* (110° F.) hasten its absorption, and external application of heat, as by *poultices*, is proper when the situation of the pelvic inflammation makes it practicable. Pelvic abscesses should be treated by *aspiration* or *incision*. In peritonitis, light warm *poultices* of *bran* or *flaxseed* are advisable.

Medicinal treatment should consist of *opiates* to relieve pain, *quinine*, *judiciously*, for its antipyretic and supporting effect, and *stimulants* when indicated. *Food* should be concentrated, nutritious, and easy of diges-

tion. The importance of maintaining *unimpaired digestion* cannot be over-estimated.

General blood-letting, at any stage of septicæmia, is improper. *Arterial sedatives*, as *aconite* or *veratrum viride*, may be useful in certain cases characterized by *circulatory excitement*, yet their *depressing effect* is so easily reached and such close observation during their use is necessary that great caution should be displayed with them, lest they be administered too freely or in unsuitable cases.

Salicylic acid, as well as quinine, given in large doses may reduce the temperature, and the wet pack, with careful avoidance of its depressing effect, is similarly suitable.

Tympanites, when excessive, causes pain and a depressing reflex influence on the nervous system. *Stimulating enemata* containing *assafoetida* or *turpentine*, or even *abdominal puncture* of the intestines by *fine aspirator needles* will afford some relief.

CHAPER XI.

OBSTETRIC OPERATIONS.

THE FORCEPS.—Delivery of the child by aid of the forceps constitutes the most common of the obstetric operations, and according to the situation of the child at the time of the operation, and to the conditions calling for the use of the instrument, the operation may be simple and easy, or tedious and dangerous, requiring great knowledge and skill. The value of the instrument lies chiefly in the facilities which it affords for *making traction* upon the fetus, and *compression* of the head. To the instrument has also been credited certain power as a lever, but this has been much exaggerated.

The forceps is composed of two separate parts, this disunion allowing of its more easy application. When viewed as a whole, we find one end of the instrument adapted for grasping the head of the child, while the

other end is constructed to be conveniently held by the operator. The fetal end of the instrument is composed of two blades, each having a concave surface to fit the convexity of the fetal head. The blade is usually fenestrated to make the instrument lighter, to more evenly distribute the pressure which may be called for, and to avoid adding, to the width of the fetal head, the thickness of solid blades.

The forceps may be "*long*," in which case, when the head is in the grasp of the blades while yet at the pelvic brim, the handles will be wholly external to the vulva. "*Short*" forceps, having little or no shank, suffice to reach the head when it has descended into the pelvic canal. *Straight* forceps are those having the handles continued in a line with the blades. The "*pelvic curve*" is found in the *long* forceps of the present day, being situated in the shank and beginning of the blades. It is intended to adapt the instrument to the curve of the pelvic canal so that when the blades are applied and in the axis of the superior strait, the handles may present themselves at the vulva lying very nearly in the axis of the pelvic outlet. The "*cephalic curve*" is found in each blade and

adapts it to the convex surface of the child's head. The "*perineal curve*" is a term now coming into use in connection with the forceps of Tarnier, and will be described later. The *lock* is at the crossing of the two halves of the instrument and keeps them symmetrically placed during extraction. A device of some kind is generally found at the end of handles for the purpose of enabling the operator to regulate the amount of compression to be applied to the child's head. It would not be wise here to enter upon a description of the differences existing among the instruments bearing the names of Naegele, Smellie, Levret, Simpson, Hodge, Elliot, Bedford, Taylor, Wallace, and of others. In principles of construction they are alike. In such details as the form of the lock: length, breadth, thickness, or shape of the blade: shape of handle, etc., are variations. In great measure the preference for one instrument over others depends upon early teaching or custom in using.

The *instrument of Tarnier* deserves some separate mention, however, as having some original modifications. It is intended for use in high operations, being especially adapted to those labors in which the head is disposed

to impinge upon the pubic border at the superior strait. In such cases certainly, and in high operations generally, the instrument of Tarnier is superior to others in accurately grasping the head, and effecting delivery with the least possible risk to maternal parts. In the forceps of Tarnier the handles, instead of being continued in the direction of the shank, are, by a backward bending of the shank, di-

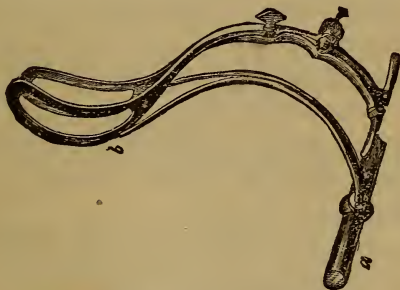


FIG. 44.—Forceps of Tarnier.

rected more backward than in the common forceps. The handles lie on a plane about three inches above the posterior curve of the blades. To the posterior curve of the blades at the ends nearest the handles are two movable traction rods to which can be attached the traction handle which latter has a deep curve, concave toward the perineum. By this latter handle when traction is made, with the

blades within the superior strait of the pelvis, the force is in *reality* applied in the line of the axis of the superior strait.

In the selection of ordinary forceps there should be care to avoid blades which are thin and have considerable spring. Besides the danger of lacerations by thin edges, there is greater risk of fatal compression of the child's head. The springy blades, when traction is made, slip forward in the direction of the operator, the tips of the blades become separated more than is intended, yet owing to the elasticity of the blades their tips impinge with great force, at their points of contact, upon the head. Narrow or short handles are objectionable.

Indications for the use of the forceps have been mentioned in connection with the varieties of unnatural and complicated labor.

Preliminary to the operation, which in this country is always performed with the patient on the back, the bladder should be emptied by a new, gum elastic catheter, the rectum cleared of fecal matter, and an anæsthetic administered in all cases unless the head is well descended to the pelvic outlet. Even then an anæsthetic is preferred by many. After turning the patient crosswise in the

bed, with her hips close to its edge, with a sufficient number of assistants to steady the limbs and afford other help, the forceps are to be applied after having been warmed and oiled.

High operations should not be performed, as a rule, until the os is dilated. Occasionally the blades of a narrow forceps, like Taylor's, may be introduced within a cervix which is two-thirds dilated, and, with gentle force, dilatation may be completed by the aid of the instrument, the head being drawn against and into the os.

The lower blade should be the first to be introduced, and with two fingers of the right hand, palm upward, passed into the vagina until their tips touch the head, the blade should be carried gently upward until it reaches and begins to pass between the sacrum and the head. Then directed in a combined upward and lateral direction, it finally reaches the left lateral part of the pelvic brim, with its concavity against the head, looking toward the right side of the pelvis. In passing the cervix, the tip of the blade should be kept well against the head. There being *more room* toward the sacral wall of the pelvis, it requires less force to introduce the

blade *there*, until it lies upon the head, then to be turned laterally, than to attempt from

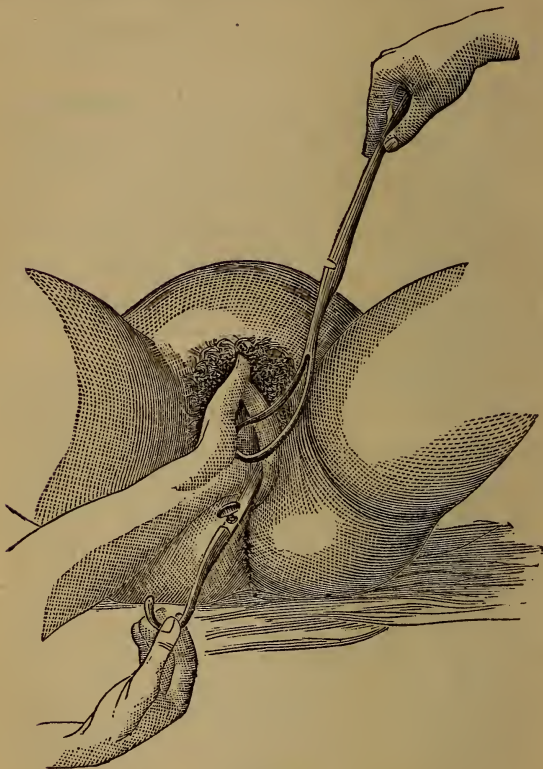


FIG. 45.

the outset to pass it in at the left side of the pelvis. After this blade has reached its des-

tion, the handle should be depressed toward the rectum and held by an assistant. A similar manipulation should be used to introduce the other blade, with reversal of the hands of the operator in the part which they take, and if the blades are situated in their proper places, locking will readily take place. The nearly symmetrical position of the forceps to the pelvis when thus applied constitutes the "*pelvic application*." In the "*cephalic application*" indorsed by some obstetricians, it is sought to place the blades laterally to the child's head without regard to the relation of the latter to the pelvis. Traction should be made so as to cause the head to descend in the axis of whatever part of the pelvis it occupies, and as the pelvic canal is curved to a marked degree, the direction of the traction force has to be changed frequently during descent. At first the handles must be held so far posteriorly as to depress somewhat the perineum. Intermittent traction should be employed, the force applied during labor pains.

In the intervals between pains, traction should be relaxed, and occasionally the head liberated from all compression. If the head has been grasped by the forceps when lying

in a transverse or oblique position, a tendency to rotate during descent will be present usually, and should be *noted*, the forceps being removed and re-applied to the head in the new position which it assumes.

Steady downward force is preferable to a lateral, pendulum motion, though when there is very firm impaction of the head, the latter motion may safely serve to start the head from its fixed position. Hasty delivery exposes the patient to dangers of contusion and laceration, hæmorrhage, and shock which may evoke complications which cannot be counterbalanced in any way. Descent of the head from the uterus into the vagina until it reaches the hollow of the sacrum gives us the condition which, if occurring spontaneously, there then being delay, would call for the "*low operation*." The advice already given regarding the application of the instrument suggests readily the method to be followed in these cases.

When the head reaches the pelvic outlet and the forceps is in use, traction should be straight out from the vulva. While the head is passing the tuberosities of the ischia which are the last of the bony points to offer obstruction, *moderate* as well as intermittent force

must be employed in order that distention of of the perineum be *gradual*. We seek to imitate as far as possible the natural method



FIG. 46.—Low operation.

by which the resisting perineum can be stretched and dilated without rupture. It is always better that twenty minutes to half an

hour be occupied in the passage of the head past the perineum. As the head seems about to emerge, remove the forceps, the handles of which by this time have been directed

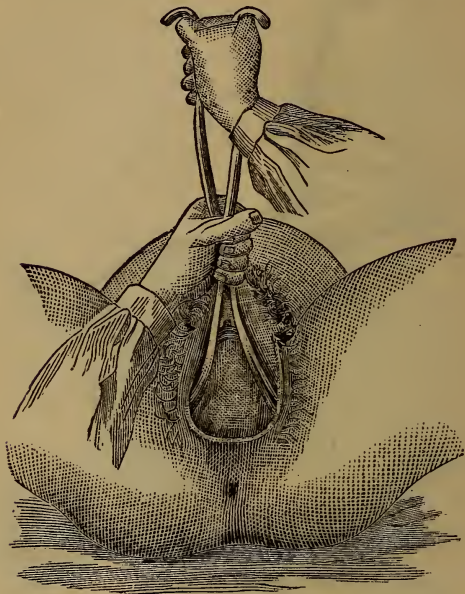


FIG. 47.

very much forward, using no force in so doing.

Safety to the perineum will depend upon its *gradual distention* by alternate descent and recession of the head, by *removal of the*

forceps before the passage of the head, by *maintaining flexion* of the head with the finger in the rectum, while, at the same time, the *perineum is drawn forward*, and by *complete emergence of the occiput* before the passage of other parts of the head.

If labor has been of long duration and the parts are dry, use vaseline freely, remembering also that, at no time, is full *obstetric* anæsthesia of as great importance as at this. During the entire time that the forceps is applied to the head, the latter should be frequently touched to note its advance and its relation to the instrument.

FORCEPS TO THE AFTER-COMING HEAD.—There are times when the instrument is called for in delivery of the head after the remainder of the child, which has presented by the breech, has been born. In the great majority of breech cases, no more can be done by the aid of the instrument than by manual efforts at extraction, and valuable time would be lost during the putting on of the blades.

The instances in which the instrument is indicated—and should be at hand, warmed and oiled—are: cases in which there is known to be a pelvis diminished in its diame-

ters, the labor being at term with a child of average size; instances in which the head is caught at the superior strait owing to disproportion between pelvis and head, or from extension of the latter; finally, when manual efforts, properly applied during a reasonable time, fail to cause any advance of the head.

Application.—If the head is low down with the chin posteriorly situated, let an assistant lift the child's body forward toward the abdomen of the mother, have the perineum depressed, and the vagina and child's mouth cleared of mucus to allow, if possible, access of air to the child's lungs, apply the blades with celerity, and, making traction with the handles brought well forward, delivery may be effected quickly.

If the head is caught at the brim, more difficulty will be encountered, and care must be taken that the funis is not pinched. If the head is extended, with the *chin anterior*, we seek by the forceps to bring the occiput into the hollow of the sacrum, and then by traction to deliver the head. If extension of the head exists, the *occiput being anterior*, we seek to bring the face into the sacral excavation. If the head resists the forceps and extension persists, the child being *known to be*

dead, it is better to diminish the diameters of the head by perforation and cephalotripsy than to incur the great risk of extensive laceration of the perineum by dragging down the head in a condition of extension.

IN OCCIPITO-POSTERIOR, VERTEX CASES, it must be remembered that, as the head emerges, the condition of flexion remains until the head is entirely born. As the head is passing the pelvic outlet, we do not, therefore, bring the handles forward toward the mother's abdomen, but, rather, depress them, in order that the face and chin may pass out from beneath the pubic arch.

IN FACE PRESENTATION, the case being so far progressed that conversion into the vertex is impossible, the forceps is a proper aid to delivery if delay calls for help. In cases with the chin anterior, the blades must be inserted sufficiently far to securely grasp the occiput. In mento-posterior cases, the forceps may effect delivery with, almost invariably, death of the child and injury to the mother. Anterior rotation of the chin cannot be accomplished with the instrument, its application usually retarding, even, any tendency to spontaneous rotation.

CRANIOTOMY AND EMBRYOTOMY.

Craniotomy is an operation by which the child's head is reduced in its diameters by perforation, by mechanical crushing, or by both. That operative procedure by which the head is crushed is called *cephalotripsy*.

When, as in these measures, the life of the child will be destroyed, there should have been careful deliberation to decide that other operations which are not sacrificial to the child may not afford the same safety to the



FIG. 48.—Smellie's scissors.

mother as craniotomy. When we have to do with cases where there is known to be death of the child, craniotomy may be employed properly, even more frequently than is common, in order to diminish the minor risks to the mother which attend labor

Instruments for perforation. — The most useful of the early instruments for this purpose is Smellie's scissors.

Of this there have been various modifications, two of which can be warmly recommended, viz., Simpson's perforator and Blot's instrument; that of Thomas should be mentioned also, which, by its gimlet point, is especially safe from slipping.

These instruments are intended to perforate the skull, enlarge the opening originally

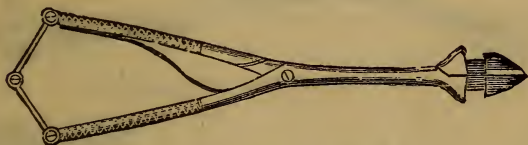


FIG. 49.—Simpson's perforator



FIG. 50.—Blot's perforator.

made, break up the brain, and assist in dislodging it from the cranial cavity. An instrument similarly used, also, is the trephine perforator which removes a circular piece of bone. An opening of this shape, however, does not best prepare the way for crushing, and the instrument is complicated, requiring much care to be kept in order.

Another class of instruments is intended for removal of portions of the cranial bones, serving also in some instances for applying traction.



FIG. 51.—Braun's cranioclast.

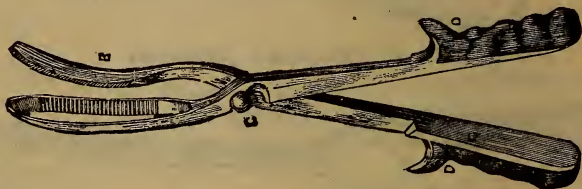


FIG. 52.—Simpson's cranioclast.



FIG. 53.

The *cranioclast* and *craniotomy forceps* are employed to seize the thin cranial vault lying adjacent to the opening made by the perfo-

rator, one blade of the instrument being passed into the skull, the other lying on the outside. After approximating the blades firmly, a wrenching and twisting motion will serve to tear away that part of the skull in the bite of the instrument. Portion after portion may be successively grasped and removed, and the head much reduced in size though the *base of the skull* cannot be affected much by the use of the instrument. Direct traction also may be made for the purpose of aiding delivery, the heavy instrument of Simpson, or of Braun, being preferable. The cranioclast may be used advantageously, also, to supplement the cephalotribe, which is yet to be described. The delivery of the *trunk* may be facilitated by the use of the cranioclast as a tractor, one blade being introduced into the thorax, usually between the scapula and clavicle. Another instrument for extracting after perforation is the *crotchet*. This is intended to be introduced through some natural or artificial opening in the fetus, and hooked on to the border of the opening. While the crotchet is an instrument of some value, its use is always attended by danger from its tearing free from its hold and inflicting wounds upon the maternal soft parts.

The blunt hook may be used for the same purpose as the crotchet, in some instances quite as effectively, and with greater safety.

The *cephalotribe* is a powerful instrument for crushing the skull after, or without previous perforation. Its value depends upon its power to reduce in size the *base of the skull*. It consists of strong, unyielding, rather narrow blades with handles, arranged as in the forceps, though when the two halves



FIG. 54.—Blunt hook and crotchet.

of the instrument are fully approximated, the space between the centre of the blades is not more than two inches across. The instrument flattens the head in the diameter in which it is applied, by making numerous partial, and sometimes complete, fractures. By its reapplication in a different diameter than the one first seized, the crushing can be made very extensive.

OPERATION.—The bladder and rectum being empty, the patient anæsthetized and properly placed for operating, the perforator is made to impinge perpendicularly upon the pre-

senting part slightly anterior to the axis of that part of the pelvic canal in which the head is situated. In passing the instrument through the vagina, its point must be held carefully against two fingers of the left hand which have been previously introduced and are touching the head. By a boring motion the instrument is made to enter the cavity of the cranium, care being taken that it does not slip from the head and wound maternal structures. Unless the head is firmly engaged in the pelvis, it must be steadied by the hands of an assistant placed in the suprapubic region. After the instrument enters the skull it should be swept in every direction to break up the brain, and its point directed to the medulla oblongata, in order that no mutilated yet living child may be subsequently born.

Carrying the instrument deep into the skull, and causing separation of its blades enlarges the opening so that the brain matter may escape, this being facilitated by uterine action which is occurring at short intervals. If no subsequent operative measures are intended, perforation may be performed when the cervix is moderately dilated, though the greater the dilatation the greater is the ease and safety

of even this step. To assist in fixing the head in these early operations the forceps, applied for that purpose, may be useful.

Perforation of the after-coming head is usually performed in the mastoid or occipital region, the body being held well out of the way towards the opposite side.

After the measures described have been taken, sufficient reduction in the size of the head may have been accomplished to permit of spontaneous delivery. Ordinarily, however, some instrumental help will be called for, owing to the already prolonged labor and to the conditions requiring that which has already been done. In some instances the forceps is sufficient, in others the cephalotribe is indicated.

Previous to the use of the latter instrument, the cranioclast may be employed for purposes already mentioned. In using it, care must be taken lest sharp fragments of bone injure the cervix or vagina, the scalp, which has not been removed with portions of skull, being advantageously turned in so as to cover the edge of the enlarged opening if efforts at extraction are made. One advantage attending the use of the cranioclast as a tractor is, that after removal of the greater part of the cranial vault,



FIG. 55.—Lusk's cephalotribe.

the face can be brought down so as to secure diameters, which are very much shortened, to pass through narrowed pelvic diameters.

The cephalotribe may be used without the previous employment of the cranio-clast, or, in the more extreme cases of deformity, after its use. It is chiefly of value to reduce in size the base of the skull, and for extraction, no other means being as suitable for the former object. In cases promising to be difficult, it is advantageous to wash out, by syringe, all brain matter from the skull. The blades of the cephalotribe should be intro-

duced in the same manner as those of the forceps, in the transverse or oblique diameter, being carried as high as possible. In general terms it may be said that, in slight degrees of pelvic deformity, this instrument may be used for crushing and traction; in the greater degrees of deformity, for crushing alone. Repeated crushing in several diameters of the skull gives the most complete results, though in extreme deformity, contusion of maternal parts must be avoided in such procedure. The principles which govern delivery by the forceps apply in delivery by the cephalotribe.

The instrument may be used without previous perforation when slight disproportion exists. In all these operative measures, the general condition of the patient should be watched, and suitable stimulation, external warmth, etc., employed, in some instances it being desirable to interrupt the operative measures for a time, in order to afford rest to the patient.

EMBRYOTOMY.

Embryotomy, by general consent, means the removal of the child by fragments, the operation being limited to parts other than the head.

It is called for by extreme pelvic deformity, as in an impacted shoulder case, or to deliver the body after craniotomy, or in fetal malformations, and tumors of thorax or abdomen.

Evisceration is accomplished by opening the thorax or abdomen with a perforator already described, or by strong scissors, the fetus having been brought as low in the pelvis as possible. The opening having been enlarged, the perforator may break up, and vulsellum forceps seize and remove the viscera. The ribs, spinal column, and muscular structures can be best removed by the strong scissors. Previous to such measures, the disinfectant douche of the bichloride of mercury, 1:2000, should be employed. Great care should be taken during the entire operation that maternal parts be not wounded by instruments or by fragments of bone. In impacted shoulder cases, if the thorax be the part most accessible, after its reduction and after division of the spine with the scissors, a phenomenon like spontaneous evolution can be artificially induced by traction on the inferior part of the child.

Decapitation may be necessary when, in impacted shoulder cases, the neck is near the centre of the pelvic canal. There are instru-

ments especially devised for this, as Braun's decapitating hook which is carefully passed

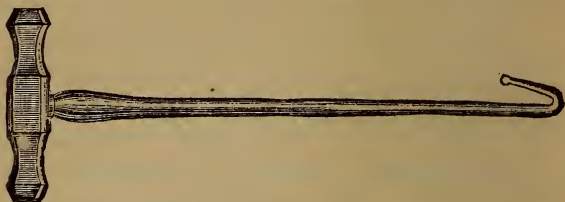


FIG. 56.—Braun's hook.

over the neck, and which, by alternating twists of the operator's hand, breaks the bony structures. After, or even *without this*, the strong scissors sever the body from the head. In all these measures, bring the neck as low in the pelvis as possible. A chain saw, or stout whip cord passed over the neck by an instrument devised for the purpose, or improvised from a catheter, will readily saw the neck apart. The maternal structures must be protected by some sort of tube, as a metallic cylindrical speculum, passed over the free ends of the cord or chain into the vagina as far as it can go. For withdrawing the eviscerated body the crotchet is useful, being much more safe than when used for traction upon a perforated head.

If the head is the last part of the child to

be delivered, the body having been separated from it, the forceps, or the crotchet introduced into the foramen magnum, will be suitable. Other instruments have been devised for various purposes in connection with decapitation and embryotomy. They are not sufficiently necessary, however, to come into common use, and a description of them would not be called for by the scope of this book.

VERSION.

Version, one of the oldest of the obstetric operations, is the substitution of one portion of the child for some other, as the presenting part.

Indications are such existing conditions as make delivery impossible or difficult, as in *shoulder or side presentations*, and *pelvic deformity*: certain relations of the uterine contents which imperil the safety of the child, as *face or brow presentation*, *prolapse of the funis*: and conditions which call for rapid delivery, as *placenta previa*, *accidental hæmorrhage*, *convulsions*. Two principal varieties are *cephalic* and *podalic version*.

In *cephalic version*, the head is substituted for some other portion of the child which is presenting. In view of the fact that when

successful, we have brought about a condition which offers greater safety to the child than after podalic version, and, if unsuccessful, the original condition remains unchanged, no complication having been added by the measures undertaken, *cephalic* version should be attempted with greater frequency than is common. It should not be attempted if haste in delivery is necessary, or if the fetus is not freely movable at the brim, presence of liquor amnii making success more probable.

Cephalic version should be attempted either by *external* manipulation or by *combined external and internal* method.

EXTERNAL VERSION, when employed to correct shoulder presentation by bringing the *head* to the superior strait, does not differ *essentially* from the operation when performed to make the *breech* the presenting part. Intervals between uterine contractions must be selected as the time suitable, and, after abdominal palpation has indicated to the operator the *exact* position of the child, such manual alteration of its position should be attempted through the abdominal and uterine walls as will bring the long diameter of the child perpendicular to the pelvic brim, with either the head or breech presenting, as may have been

desired. To relax the abdomen, the limbs should be drawn up, and chloroform is always extremely useful during the operation. In addition to the hands of the operator, those of an intelligent assistant may be an aid. Repeated and somewhat varied pressure upon the two

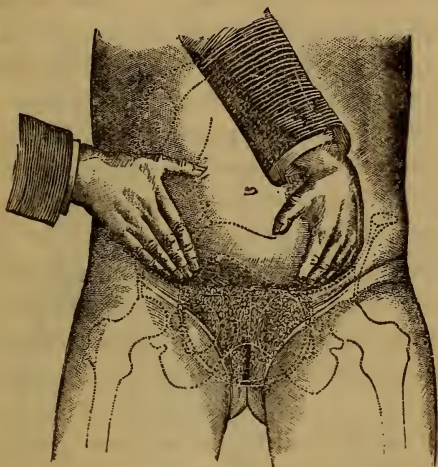


FIG. 57.—External version.

poles of the fetus, seeking to bring one fetal end to the pelvic brim and the other toward the ensiform cartilage, must be made. Liberate the fetus from any fixed position which it may have from contact with maternal parts, seeking to float it in the liquor amnii. What-

ever gain is accomplished from time to time, must be held by carefully steadying the fetus in its new position.

Placing the woman on the side toward which the head is directed may facilitate turning by causing the fundus uteri and contained breech to gravitate in that direction, this having the effect of bringing the head upward toward the pelvic brim. After successful version brought about in this way, the membranes must be ruptured and uterine contractions encouraged in order to fix the new presenting part in the pelvic inlet. Even then close attention must be given to note a tendency to, and prevent, return to the original presentation. To prevent return, the fetus must be steadied in its corrected position by the hands kept upon the abdomen for some time. A binder with pads placed laterally to the child is of advantage in some cases to effect the same result.

COMBINED EXTERNAL AND INTERNAL VERSION may be undertaken in about the same class of cases as those suitable for external version. To these may be added cases in which it is necessary to lift the shoulder or arm from slight engagement at the brim. The membranes may or may not have been

ruptured, the latter condition, or, at least, some retention of liquor amnii, being much more desirable. Fetal mobility and some degree of cervical dilation are, of course, essential. The operation may seek to bring either the head or breech to the pelvic inlet.

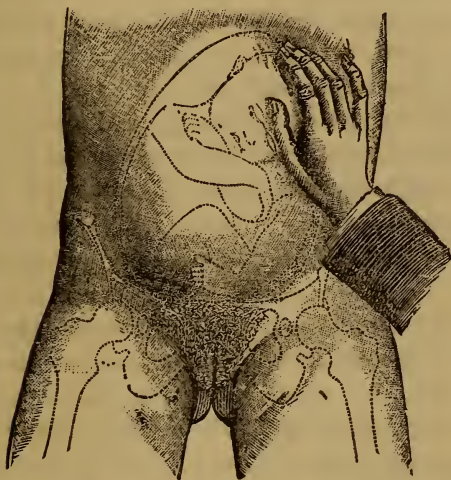


FIG. 58.—How the hand on the abdomen may assist that in the uterus.

The obstetric position having been taken by the patient, the abdominal muscles relaxed, the greater part or the whole of one hand is passed into the vagina and the fingers enter the cervix and touch the presenting part.

The other hand is placed on the abdomen over that pole of the child which is to be brought to the brim of the pelvis. The fingers in the cervix seek to move the presenting part away from the pelvic brim toward the side opposite to that at which the hand externally is applied. The hand on the abdomen seeks to depress the part which it covers, and bring it to the superior strait. When the other end of the fetus has been moved well away laterally, the hand of an assistant is useful to raise it toward the fundus uteri. Efforts should be made in the intervals of pains only. Such attention as that already spoken of is necessary to maintain the corrected position.

INTERNAL PODALIC VERSION.—This is the most common of the operations of turning. It is called for when the methods already described have failed; when in shoulder cases there is absence of liquor amnii and fixation of the child to such degree as to make the other operations unlikely to succeed; when, arising from other obstetric complications, there is reason for prompt and rapid delivery. The patient should *always* receive an anæsthetic, and be placed in the obstetric position, the bladder and rectum being empty. Clean-

liness and antiseptic precautions should prevail. The cervix should be two-thirds dilated.

In deciding which hand is to be introduced into the uterus, a mental picture of the position of the child should be made, and that hand should be used which will most readily pass, palm forward, toward the feet, the wrist flexing to adapt the arm to the pelvic curve. In head cases, the hand corresponding to the side toward which the child's abdomen is directed is most suitable. In shoulder cases, either dorso-anterior or dorso-posterior, if the head is to the mother's left, the right hand will be used most conveniently; in the other positions of the shoulder, let the operator employ the left hand.

If an arm is prolapsed, replace it if this can be readily done, or allow it to remain beside the operator's arm. Bare the arm to the elbow, thoroughly anoint it with vaseline, and, bringing the thumb and fingers into apposition, carry the hand into the vagina, through the cervix, and past the *abdomen* of the child in the direction of the feet. No efforts should be made or continued during uterine contractions, and care should be taken that fingers or knuckles do not forcibly impinge upon the uterine wall. If the feet are to-

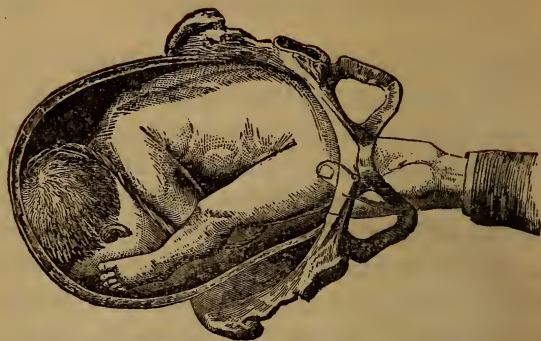
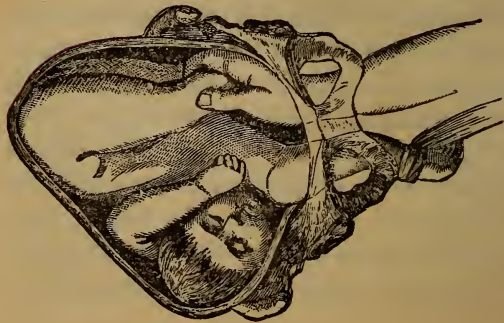


FIG. 59.—Podalic version.
Different steps necessary in its performance.

gether, grasp and bring down both, or seize the more remote of the two, which will be that of the side opposite to the presenting shoulder. The child will turn more readily

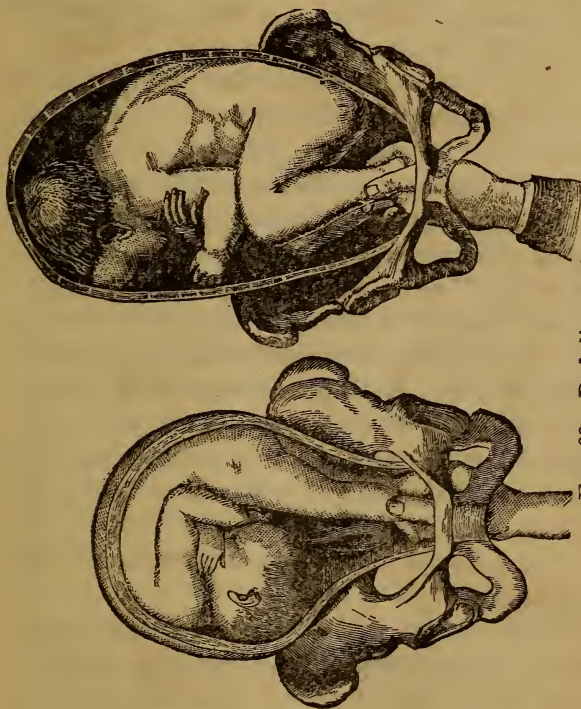


Fig. 60—Podalic version.
Different steps necessary in its performance

than if the foot corresponding to the presenting part be brought down, it being sometimes necessary, when the latter has been secured,

to again introduce the hand to secure the other foot before the child will revolve on its long axis.

In case it is required to seek the second foot, retain the first by attaching a piece of broad tape to the ankle.

In all ordinary cases, if the manipulations are being performed in a proper manner, no great force is called for. The other hand employed externally can often greatly aid in the turning by depressing the breech or raising the head. When version is accomplished, the case resembles that of breech, and, unless there are reasons for hasty delivery, should be allowed to proceed as has been advised under the consideration of breech presentation. If immediate delivery is called for, draw down the body, seek the arms in the manner already recommended, which are likely to be beside the head, and empty the uterus. During delivery, take advantage of, and promote uterine action.

DIFFICULTIES which may be encountered are, first, to distinguish between the foot and hand when the former is being sought. Avoid mistake by a calm examination of each portion of the fetus with which the hand comes in contact. Second, the hand of the

operator may become more or less wearied and incapacitated by vigorous uterine action. To prevent this, relax and rest the hand occasionally, avoid exciting the uterus by violent efforts, and operate only in intervals of contraction. This conduct may also avert injury to, and even rupture of the uterus. Third, in neglected and impacted shoulder cases, after one of the feet is brought down (and in this class of cases one only can be obtained usually), the child may not revolve, and the part originally presenting shows no disposition to move from its position at the pelvic inlet. To overcome this complication, attach to the foot a piece of tape or bandage and, making traction by this with one hand external to the vulva, seek, with the other in the vagina, to push upward and liberate the impacted shoulder. Fourth, the funis may prolapse and must be protected according to the means best suited to each case.

TURNING IN PLACENTA PREVIA may be performed when the cervix is less dilated than to that degree which would be required in other cases, for the cervix is so *dilatable* that it will readily yield to the pressure of the hand, and of the descending body of the child. If the placenta is laterally situated, the method

by combined external and internal manipulation may accomplish the object. If it fail, pass the hand through the membranes and reach the feet. When the placental implantation is central over the internal os, pass the hand between placenta and uterus in the direction of the location in which palpation has shown the feet to be situated. After passing the hand *beyond* the margin of the placenta, penetrate the membrane. This is much better than to attempt to introduce the hand through the placenta.

INDUCTION OF ABORTION AND PREMATURE LABOR.

There are sometimes reasons why, in the interest of the mother, and perhaps in behalf of the child, it is inadvisable to permit pregnancy to go to term. When interference is solely for the sake of the mother, that period in pregnancy is selected which offers the greatest prospect of a safe result to her. When the circumstances calling for interruption of pregnancy permit, with safety to the mother, that condition to proceed until considerably advanced, the hope arises that the child too may be saved, and the endeavor is made in its interest, to pass beyond the time

of viability, the attendant feeling always that the mother's safety should never be *at all* involved by this effort.

THE PRODUCTION OF ABORTION may be called for in *chronic organic disease* of the *kidneys, liver, or heart*, in *irremediable vomiting, incarceration of a displaced uterus, cancer of the cervix*, and when *pelvic deformity* exists with the conjugate reduced to an inch, though in this latter class of cases such difficulty and danger may attend the operation that an obstetric operation at the end of pregnancy may be more safe.

The best time for such operation is when gestation is advanced about two and a half months, the products of conception then usually escaping entire. Other periods are preferred by some.

The safest method is by the introduction of *laminaria tents*, several of increasing size, successively introduced, being often necessary. As soon as uterine contractions are excited, ergot may be given. Ergot, quinine, and oxytocics generally, cannot be *depended upon* to excite abortion, though preparatory to mechanical interference, the daily use of the *hot, vaginal douche*, and *slight purgation* may prove useful, relaxing mea-

tures, even in some cases, meeting a more full purpose. The *uterine sound* or some similar instrument may be used to puncture the membranes, but this method has its drawbacks. It is less prompt in its results, allowing time for changes of decomposition, the vitality of the fetus and membranes having been destroyed usually by the rupture, and the products of conception are quite likely to be passed in a fragmentary way.

INDUCTION OF PREMATURE LABOR may be called for in *contracted pelvis*, in *nephritis*, *organic affections of the liver or heart*, *placenta previa*, *accidental hæmorrhage*, *tumors*, *uncontrollable vomiting*, *pernicious anæmia*, *uræmic convulsions*, and in women who *habitually bear large children*: in the interest of the child solely, when there has been repeated loss of children late in pregnancy from *placental disease*. In this latter class of cases, the time at which to act must be determined by closely watching for indications of failing fetal vitality, *i. e.*, weak and irregular heart and feeble movements.

The methods employed are those for exciting uterine action and those accelerating it. Oxytocics, and mammary or rectal irritation are unreliable for the first, and the former sometimes harmful for the second object.

Catheterization. A new, soft rubber or gum elastic bougie or catheter, one somewhat stiff being preferable, may be passed between the membranes and uterine wall until the fundus is approached, and the instrument allowed to remain in position for ten or twelve hours. Repetition of this procedure may be required before uterine action is excited, and several attempts of this kind may fail to accomplish the desired result. Little danger of disturbing the placenta is to be feared, for the instrument, if it touches the placental border, will pass to one side of that organ. Retention of the instrument may be effected by a small vaginal tampon. In primiparæ a small laminaria tent may be first required to cause dilatation of the cervix sufficient for the passage of the bougie.

Puncture of membranes may be made opposite the cervix, or at a point a short distance above, by an instrument arranged for the purpose. The advantage of the latter method is from gradual escape of liquor amnii. It may be done by any sharp instrument, wounding of the uterus being carefully avoided. Prompt uterine action is rarely excited in this way, days often elapsing. Labor lacks the assistance of the membranous wedge,

and the child may be harmed by the close application of the uterus to it.

One advantage attending this method is decreased risk of infection which may attend the retention of an instrument against the inner uterine wall.

Separation of the membranes from the lower uterine segment. Dilatation of the cervix must be present sufficient to admit the finger which is to be repeatedly swept about, and the membranes detached from the uterine wall in all directions to the fullest extent possible. It is disagreeable and tedious to patient and physician and may act tardily or not at all.

Intra-uterine injections. This measure is accomplished by passing a catheter about two inches into the uterus between the membranes and uterine wall, and injecting an ounce or more of warm water. Some have advised to continue the injection until the patient complained of discomfort from uterine tension. As much as a quart of water has been injected. The procedure is followed by labor which shows a degree of promptitude corresponding to the amount of liquid employed and the degree of penetration toward the fundus. If the injection is small, repetition may be neces-

sary. Fatal results have attended this variety of treatment, due to *shock*, *injection of air into the sinuses*, and to *mechanical injury* of the uterus, the larger the injection the greater being the danger.

Vaginal douche. For securing immediate results this method is fruitless, for a number of days, and even weeks, during which it is employed twice daily, may elapse before a response is obtained. The measure may wholly fail. Each douche should, for a period of half an hour, project a stream of some force against the cervix. Two effects which may be noted are, a relaxed and softened cervix, and uterine action excited in a reflex way. The water should be as warm as the patient will tolerate. The method is open to the risk of entrance of air, into the cervix and uterus, from such admixture with the water passing through the syringe.

The Barnes dilators, when cervical dilatation is present sufficient to allow the introduction of the smallest size, can be used to mechanically dilate the cervix, provoking, as they often do, uterine action as well. They are of special value to expedite labor which, when induced prematurely, is often characterized by inefficient contractions. If the

head presents, there is liability to its displacement by the distended rubber bag and the shoulder may succeed it as the presenting part.

Premature labor, when induced, is apt to be tardy, with inefficient pains. Rupture of the membranes will accelerate it, and is proper when the cervix will admit four fingers. Other measures, such as have been recommended in tedious labor and for rigid os, should be employed.

LAPARO-ELYTROTOMY (THE THOMAS OPERATION).

When pelvic deformity exists to a high degree, it may be advisable to extract the child in a way that will avoid its passage through the pelvis. This is called for not alone in the interest of the child, for statistics of craniotomy and embryotomy, when performed through pelves greatly contracted, show a high rate of mortality for the mother. The operation of laparo-elytrotomy meets these indications, and differs from Cæsarean section inasmuch as the peritoneum and uterus are not wounded.

In the consideration of the operation in a given case, the size of the child is to be con-

sidered as well as the degree of deformity. Preliminary to the operation the cervix must have been dilated spontaneously or by the aid of the Barnes bags, bladder and rectum being empty.

An incision is made on the right side, parallel to, and an inch above Poupart's ligament, beginning above the anterior, superior spine of the ilium, and extending to within an inch and three-quarters of the spine of the pubis. The inner extremity of the incision should be about an inch and a half above the pubes. The abdominal muscles are then divided throughout the line of the incision. The peritoneum, when reached, is to be carefully lifted up from the iliac and transversalis fasciæ until the fingers reach the vaginal wall. The uterus is lifted forcibly upward, and to the left. A metal catheter kept in the bladder indicates the situation of that organ, which must not be injured. A blunt, wooden instrument, as large as a medium-sized rectal bougie, should be passed into the vagina and pressed upward; to bring the vagina as near to the abdominal wound as possible. A small cut is then made in the vagina. This must be as low down as possible—about an inch and a half below the cervix. By this

low incision the ureter, which is situated at a higher level, and the pouch of Douglas are avoided, and there are fewer vessels encountered liable to be injured.

The vaginal wound should then be enlarged by tearing with the fingers forward toward the pubes and backward in the direction of the sacrum. The fundus of the uterus being then brought well to the opposite side, the operator proceeds to withdraw the child through, successively, the os uteri, the vaginal wound, and the abdominal incision. Removal of the child may be accomplished by the forceps or version, the placenta following by the same channel. Hæmorrhage should be met by pressure, or styptic applications.

Vesico-vaginal fistula, if occurring, should be closed by silk or catgut sutures. A drainage tube should be passed through from the abdominal wound into the vagina, and the greater part of the abdominal wound closed by stitches and adhesive plaster.

During healing, the wound must be kept clean by antiseptic injections.

CÆSAREAN SECTION.

The removal of the child by abdominal and

uterine section, the peritoneal cavity being opened, is called for in *high grades of pelvic deformity*, when, as far as can be judged, the dangers to the mother would be less by such delivery than would attend operative extraction by the natural passages. Advanced *cancer of the cervix* and *solid tumors*, occupying persistently the pelvic cavity, may require such treatment. For the purpose of saving the child, the operation may be performed as the speediest and safest way of delivery after death of a pregnant woman.

The greatest success will follow this operation when there has been the most full observance of details with reference to the supply of suitable instruments, the presence of uncontaminated atmosphere, extreme precautions of cleanliness and disinfection, and selection of a time before exhaustion of the patient. If possible, operate before rupture of the membranes, ether being the anæsthetic to be employed. The abdominal muscles should be relaxed by moderate flexion of the knees as the patient lies on her back. The bladder should be emptied by a medical attendant.

Operation.—An incision through the abdominal wall is made in the linea alba, there being few vessels liable to be cut in that situ-

ation, and layer by layer the tissues are divided, the incision being carefully kept in the line of the original cut, until the peritoneum is reached. The incision should extend from the navel to within an inch and three-quarters of the pubes. All bleeding should have ceased before the peritoneum is opened. This membrane should be penetrated and the opening extended by cutting from within outward, the intestine being carefully kept away from the reach of the knife.

The care of the intestines and the management of the uterus should be given to one assistant, who should now compress the latter organ laterally, and bring the middle of it opposite to, and well forward against the abdominal wound. The incision in the uterus should be four or five inches in length, but should not involve either the fundus or the cervix. The incision should be made as quickly as is consistent with safety, and when the uterine cavity is opened, the assistant should introduce a finger at each extremity of the wound, and hook the organ up against the abdominal wall. This procedure prevents the entrance of blood and liquor amnii into the peritoneal cavity, as well as escape of

loops of intestine through the abdominal wound.

The child should be quickly removed—if convenient the head being first seized, for when taken out feet first, the incision may contract around the neck and inconvenience the operator in subsequent delivery of the head, or lead to a ragged tear of the uterus. The placenta and membranes are next carefully extracted. If the former has been wounded when the uterine incision was made, its speedy removal is necessary to check dangerous hæmorrhage. As the uterus decreases in size, owing to escape of its contents, the assistant carefully guards against protrusion of the intestines. When severe hæmorrhage occurs, if some extrusion of the uterus can be produced, the loss of blood can be kept external to the abdominal cavity. Complete contraction of the uterus, after delivery of the fetus and secundines, is essential, and, if necessary, direct manual compression may be employed, all clots being removed from its cavity by the fingers.

Interrupted *carbolized silk* sutures should close the incision in the uterus, and, to approximate the peritoneal edges, a few superficial stitches may be added.

The peritoneal cavity, especially the dependent region of the recto-uterine pouch, should be cleansed *perfectly* of all material foreign to its surface. The abdominal wound should be closed with wire or silk sutures, or hare-lip pins, and in every case care should be taken that the peritoneal edges are neatly brought together. The abdomen having been cleansed, it should be covered with an anti-septic dressing.

Subsequent treatment consists in placing the patient under a competent nurse who will carry out, in every detail, directions which should enjoin absolute quiet and simple diet. The catheter should be employed and puerperal disorders met with appropriate treatment.

Dangers are those of *hæmorrhage*, *metritis*, and *peritonitis*, *exhaustion* from an operation which is often performed when the patient is already prostrated by a long and difficult labor, *shock*, and *septicæmia*.

THE PORRO OPERATION.

This is a modification of the Cæsarean operation, consisting in the final ablation of the greater part of the uterus and the ovaries. It is intended to remove the risk from leakage

of blood through the uterine wound into the abdominal cavity, which is liable to occur after the Cæsarean section. The operation does not differ from the one previously described until after the emptying of the uterus. Then the organ is raised through the abdominal wound, and a strong wire, by means of the *écraseur*, or a clamp is placed about the neck, above the internal os, which is constricted until the circulation is arrested permanently. The uterus is then amputated, and the stump, after being seared with the *Pacquelin* cautery, is fastened in the abdominal wound as is sometimes done with the pedicle after ovariectomy. The clamp or wire must not lacerate the peritoneum. The stump separates at the end of two weeks.

THE PORRO-MÜLLER OPERATION leaves the same result finally, and differs from the Porro operation in that the uterus is lifted through the abdominal incision before it is opened. The delivery of the uterine contents is accomplished, therefore, with the uterus external to the peritoneal cavity, and the passage of blood and liquor amnii into the latter cavity during the operation can be effectually prevented. This procedure requires an incision of at least six or seven inches, and a long in-

cision always adds to the danger in abdominal surgery. The cervix is to be constricted before the uterus is opened, and the child to be then extracted with speed.

LAPAROTOMY for rupture of the uterus.—After what has been said regarding Cæsarean section, little need be written on this subject. The general principles governing one operation would apply to the other. The uterine rent should be closed by sutures and especial attention be given to replacement and coaptation of the peritoneum investing the uterus. It is common to find that this layer has been lifted up from the uterus to some extent before yielding an aperture for the escape of the child into the abdomen, and therefore the rent in the peritoneum may not correspond to the tear in the uterine muscle.

The cleansing of the abdominal cavity should be thorough.

In some cases, when the lacerated and irregular character of the uterine rent would indicate that, after the most careful closure by stitches, primary union would fail to occur, and some escape of blood into the peritoneal cavity would continue after the operation; in cases in which, owing to the softened and degenerated condition of the uterine wall,

the ordinary tension of sutures would cause them to tear the tissues; or when pelvic deformity is present to a degree to make it undesirable that a woman should again become pregnant, it would be quite proper to raise the question of the advantage which might be gained from ablation of the greater part of the uterus, as is done in the Porro operation.



INDEX.

- Abdominal gestation, 66
Ablation of the uterus after its rupture, 277
Abortion, spontaneous, 58
 induction of, 262
Accidental hæmorrhage, 160-167
Adhesion of placenta, 175
Afterpains, 101
Air, entrance of, into uterine vessels, 201
Albuminuria, 55, 194
Allantois, 29
Amnion, 27
Anatomy of the pelvis, 69-77
 of the fetal head, 77-79
Anchylosis of sacro-iliac synchondrosis, 119, 121
Ante-partum hæmorrhage, 160
 hour-glass contraction of the uterus, 113
Arbor vitæ, 11
Area germinativa, 27
 pellucida, 27
Arm, dorsal displacement of, 157
 presentation, 142-146
Arms, how to bring them down, 132, 260
Articulations, pelvic, 73
 rupture of, 191

Atresia of vagina and cervix, 114

Axes of pelvis, 77

Bacteria in puerperal fever, 211

Ballottement, 47

Barnes' dilators in accidental hæmorrhage, 166

dilators in induction of premature labor, 267

dilators in placenta previa, 171

dilators in puerperal eclampsia, 195

dilators in rigidity of the cervix, 112

dilators in tedious labor from uterine inertia,
110

Bartholin, glands of, 5

Binder after labor, 100

Bladder, care of, after labor, 101

containing calculus, obstructing labor, 115

Blastodermic membranes, 27

Blood, changes in, during pregnancy, 40

Blunt hook, 244

Breast signs in pregnancy, 42-44

Breasts, management of, 104

Breech presentation, 126

presentation, causes of, 128

presentation, diagnosis of, 128

presentation, impacted, 133

presentation, mechanism of, 130

presentation, prognosis in, 130

presentation, treatment of, 131

Bregma, 78

Brow presentation, 140

presentation, treatment of, 141

Bruit, uterine, in pregnancy, 48

Bulbi vestibuli, 4

Cæsarean section, 113, 125, 270

- Calculus, vesical, obstructing labor, 115
- Cancer of cervix obstructing labor, 113
- Caput succedaneum, 92
- Carneous mole, 61
- Carunculæ myrtiformes, 7
- Cephalic version, 251
- Cephalotribe, 244, 247
- Cephalotripsy, 240, 247, 248
- Cervix, cancer of, 113
 - changes in, during pregnancy, 45
 - lacerations of, 190
 - rigidity of, 111
- Cessation of menses, 41
- Chloral in eclampsia, 196
 - in insanity, 205
 - in insomnia, 53
 - in rigidity of the cervix, 112
- Chorea, 53
- Chorion, 31
- Circulation of the fetus, 37
 - omphalo-mesenteric, 29
- Clitoris, 2
- Coccyx, 70
- Colostrum, 104
- Combined external and internal version, 254
- Commissures of the vagina, 2
- Conception, 23
- Convulsions, uræmic, 192
- Cord, formation of, 36
 - prolapse of, 180-184
 - treatment of, after birth of head, 98
 - treatment of, in breech presentation, 132
 - tying of, 98
- Corpora cavernosa, 2

- Corpus luteum, 21
- Cranioclast, 242
- Craniotomy, 240
 - forceps, 242
 - operation of, 244
- Cranium, premature ossification of, 154
- Crotchet, 244
- Cystocele obstructing labor, 115

- Death, delivery of child after, 271
 - sudden, after labor, 198, 201
- Decapitating hook, 250
- Decapitation, 249
- Deciduæ, 33
- Deformity of the pelvis, 117
 - of the pelvis, dangers from, 121
 - of the pelvis, diagnosis of, 122
 - of the pelvis, treatment of labor in, 125
- Delivery, care after, 100-105
 - premature, 58, 264-268
- Descent of head in labor, 87
- Diagonal conjugate, 124
- Diameters of fetal head, 78
 - of pelvis, 76
- Diarrhœa of pregnancy, 52
- Dilatation of cervix, how effected, 81
- Diseases of pregnancy, 50-57
- Discus proligerus, 20
- Dorsal plates, 27
 - displacement of arm, 157
- Double uterus, 68
- Douche, in protracted first stage of labor, 110, 112
 - in puerperal fever, 223
 - to induce labor, 266, 267

- Douglas, cul-de-sac of, 6
Ductus arteriosus, 38
 venosus, 37
Dry labor, 158
- Eclampsia, 192-196
Electricity in extra-uterine pregnancy, 67
 in post-partum hæmorrhage, 177
Elytrotomy in extra-uterine pregnancy, 66
Embolism, 196-201
Embryotomy, 248
Endocolpitis, 214
Endometritis, 214
Epiblast, 27
Erectile tissue, 4
Ergot of rye, 99
Eustachian valve, 37
Excessive fetal development, 154
Exostoses, 117
Expression of placenta, 99
Expulsion, spontaneous, 146
Extension of head in labor, 88
External rotation, 89
 version, 252
Extra-uterine pregnancy, 63
 pregnancy, varieties of, 64
 pregnancy, signs of, 65
 pregnancy, treatment of, 67
Evisceration, 249
Face presentation, diagnosis of, 138
 presentation, mechanism in, 135
 presentation, prognosis in, 138
 presentation, treatment of, 139
 presentation, varieties of, 134

- Fallopian tube, 13
False pains, 93
Fatty mole, 62
Feces, impacted, obstructing labor, 115
Fecundation, 24
Fetal circulation, 37
 head, 77
 heart, 48
Fever, puerperal, 207-225
Fibroid tumors obstructing labor, 114
Flexion of head in labor, 86
Footling presentation, 126
Foramen ovale, 37
Forceps, 226-239
 in face presentation, 239
 in occipito-posterior cases, 239
 of Tarnier, 228
 preliminaries to the use of, 230
 the operation, 231
 to the after-coming head, 237
 varieties of, 227-228
Fornix vaginæ, 7
Fossa navicularis, 6
Fourchette, 2
Funis, structure of, 36
 long, 159
 prolapse of, 180-184
 short, 159
 treatment of, after birth of head, 98
 treatment of, in breech presentations, 132
 tying of, 98

Gastrotomy, vide laparotomy, Cæsarean section
Gelatin of Wharton, 37

- Generative organs, external, 1
organs, internal, 7
- Germinative vesicle and spot, 21
- Glands of Naboth, 11
utricular, 10
vulvo-vaginal, 5
- Glans clitoridis, 2
- Globule, polar, 25
- Graafian follicle, 18
- Hæmatocele, 116
- Hemorrhage, accidental, 160-167
post-partum, 173-179
secondary post-partum, 179
unavoidable, 167-173
- Hand presentation, 144
- Head, anatomy of the fetal, 77
dolicho-cephalic, 134
premature ossification of, 154
presentation, mechanism of, 84
- Heart sounds, fetal, 48
- High grades of pelvic deformity, treatment in, 268-271
- Hook, the blunt, 244
- Hour-glass contraction of uterus, ante-partum, 113
contraction of uterus, post-partum, 174
- Hydatidiform mole, 62
- Hydrate of chloral, 112, 196, 205
- Hydrocephalus, fetal, 155
- Hydrothorax, 156
- Hydroperitoneum, 156
- Hymen, 7
- Hypoblast, 27
- Impregnation, site of, 24

- Inclined planes of the pelvis, 74, 75
- Inertia uteri, 110, 173
- Induced abortion, 262
- Induction of premature labor, 264
- Injections in post-partum hæmorrhage, 177
 - to induce labor, 266, 267
- Innominate bone, 71
- Insanity, puerperal, 202
- Insomnia in pregnancy, 53
- Instruments for perforation, 240
- Intermittent uterine contractions, 47
- Internal organs of generation, 7
 - version, 256
- Interstitial pregnancy, 64
- Inversion of the uterus, 184-186
- Involution of the uterus, 103

- Jaundice in puerperal fever, 222

- Kiestine, 44
- Knee presentation, 126

- Labia majora, 1
 - minora, 3
- Labor, causes of, 79
 - difficult, from obstructions in soft parts, 111-117
 - duration of, 84
 - management of, 92
 - mechanism of, 84
 - phenomena of, 80-83
 - powerless, 110
 - precipitate, 107
 - premature, 58, 59, 264-268
 - stages of, 80
 - tedious, 108

- Lacerations of the cervix, 190
 of the maternal structures, 178
 of the perineum, 191
 of the vagina, 190
- Lactation, 104
 insanity of, 203, 205
- Laminæ dorsales, 27
- Laparo-elytrotomy, 268
 hysterotomy, vide Cæsarean section
- Laparotomy for rupture of the uterus, 276
 in extra-uterine pregnancy, 67
- Ligament, broad, 10, 12
 of the ovary, 14
 round, 13
 sacro-iliac, 73
 sacro-sciatic, 74
 sacro-uterine, 12
 vesico-uterine, 12
- Liquor amnii, 31
- Lochia, 102
- Locked twins, 150
- Long funis, 159
-
- Malacosteon, 117
- Malpresentations, 126-147
- Mammary glands, management of, 104
 signs of pregnancy, 42
- Management of labor, 92
- Mania, 204
- Masculine pelvis, 120
- Meatus urinarius, 4
- Mechanism of normal labor, 84
- Melancholia, 202
- Membrana granulosa, 20

- Menstruation, 22
 cessation of, in pregnancy, 41
- Mesoblast, 27
- Metritis, 215
- Micrococci, 212
- Molar pregnancy, 61-63
- Monsters, 156
- Mons veneris, 1
- Morning sickness of pregnancy, 42
- Movements, fetal, 46, 47, 48
- Multiple pregnancy, 47
- Muriform body, 27
- Naboth, glands of, 11
- Natural labor, 79
- Nervous disturbances of pregnancy, 53
- Nipples, care of, after labor, 105
 care of, during pregnancy, 93
 changes in, during pregnancy, 43
- Nymphæ, 3
- Oblique diameters of the pelvis, 76
- Obstetric operations, 226-277
- Obstructions in maternal soft parts, 111
- Occipito-posterior cases, 141
- Omphalo-mesenteric circulation, 29
- Organs of generation, external, 1
 of generation, internal, 7
- Ossification, premature, of fetal head, 154
- Osteo-malacia, 119
- Osteophytes, 41
- Os uteri, changes in, during labor, 80-82
 uteri, changes in, during pregnancy, 45
 uteri, œdema of, in labor, 112
 uteri, rigidity of, in labor, 111

- Ovarian pregnancy, 63
 - tumors obstructing labor, 114
- Ovary, anatomy of, 14
- Ovulation, 21
- Ovule, 20
- Ovum, changes in, 25

- Pains, false, 93
- Parametritis, 216
- Parovarium, 15
- Pars intermedia, 4
- Pelvic joints, rupture of, 191
- Pelvimetry, 123
- Pelvis, anatomy of, 69
 - as a whole, 74
 - deformed, varieties of, 117-121
 - diameters of, 76
 - figure of eight, 118
 - infantile, 120
 - ligaments of, 73
 - male, 120
 - measurements of, 76
 - oblique, 119
- Perforation of the after-coming head, 246
 - of the fetal cranium, 244
- Perforators, 241
- Perimetritis, 218
- Perineum, structure of, 6
 - laceration of, 191
 - management of, 96
 - rigidity of, 115
- Peripheral arterial embolism, 201
 - venous thrombosis, 198
- Peritonitis, 219

- Phlegmasia dolens, 198
Pigmentation, 44
Placenta, adhesion of, 175
 anatomy of, 34
 delivery of, 83, 99
 previa, 167-173
 previa, version in, 261
Plexus pampiniformis, 16
 uterinus, 16
Plural births, 147
Podalic version, 256
Polar globule, 25
Porro-Müller operation, 275
Porro operation, 274
Post-mortem laparotomy, 271
Post-partum hæmorrhage, 173-179
Powerless labor, 110
Precipitate labor, 107
Pregnancy, changes in cervix during, 44
 changes in uterus during, 44
 condition of blood in, 40
 diseases of, 50
 duration of, 49
 extra-uterine, 63
 mammary changes in, 42
 morning sickness of, 42
 multiple, 147
 signs of, 40
Premature labor, occurrence of, 58
 labor, induction of, 264
 ossification of fetal head, 154
Presentation, 84
 multiple, 157
Primitive trace, 27

- Prolapse of the funis, 180-184
Pruritus vulvæ, 53
Pubic arch, 76
Pudendum, 1
Puerperal convalescence, management of, 101
 eclampsia, 192-196
 embolism, 196-201
 fever, 207-225
 fever, prevention of, 222
 fever, treatment of, 222
 insanity, 202
 peritonitis, 219
 phlebitis, 198-201
 septicæmia, 220
 state, 100
 thrombosis, 196-201
Pyæmia, 200

Quickening, 46

Rachitis, 117
Respiratory chamber, 25
Restitution in mechanism of labor, 89
Retroversion of the uterus in pregnancy, 56
Rigidity of the cervix, 111
 of the perineum, 115
Rima pudendi, 2
Robert's pelvis, 121
Rosenmüller, organ of, 15
Rotation of head in labor, 88, 90
Rupture of the pelvic joints, 191
 of the perineum, 191
 of the uterus, 186-190
 of the vagina, 190

- Sacro-iliac ligament, 73
 iliac synchondrosis, 73
 sciatic ligaments, 74
Secondary post-partum hæmorrhage, 179
Segmentation of the vitellus, 26
Semen, 23
Septicæmia, 200, 220
Short funis, 159
Shoulder presentation, varieties of, 142
 presentation, diagnosis of, 143
 presentation, treatment of, 147
 presentation, version in, 251, 257
"Show," the, 80
Sore nipples, 105
Spermatozoon, 23
Sphincter vaginæ muscle, 7
Spondylolisthesis, 120
Spontaneous expulsion, 146
 version, 145
Straits of the pelvis, 75
Stages of labor, 80
Styptics in post-partum hæmorrhage, 177
Superfecundation, 153
Superfetation, 152
Suppression of menses in pregnancy, 41
Sutures of fetal cranium, 77
Symptoms and signs of pregnancy, 40
Syncope in pregnancy, 54

Tampon in abortion, 61
 in placenta previa, 171
Tarnier, forceps of, 228
Tedious labor, 108
Thomas' operation, 268

- Thrombosis, puerperal, 196-201
- Tough membranes, 158
- Transfusion of blood, 178
- Transverse presentation, causes of, 142
presentation, diagnosis of, 143
presentation, natural termination of, 144
presentation, prognosis in, 143
presentation, treatment of, 147
presentation, varieties of, 142
- Triplets, 147
- Twin pregnancy, 147
pregnancy, diagnosis of, 149
labor, peculiarities of, 149
labor, prognosis of, 150
labor, treatment of, 151
- Twins, locking, 150
- Tubal pregnancy, 64
- Tubes, Fallopian, 13
- Tumors obstructing labor, 114
- Tunica albuginea, 15
- Turning, vide version, 251
- Umbilical cord, see funis
vesicle, 28
- Unavoidable hæmorrhage, 167-173
- Uræmia, 193-196
- Urethra, 4
- Urine, albumen in, 55, 194
kiestine in, 44
retention of, in pregnancy, 54
- Uterine bruit, 48
- Uterus, anatomy of, 7
contractions of, during pregnancy, 47
double, 68

- Uterus, inertia of the, 110, 173
 - inversion of the, 184-186
 - involution of the, 103
 - lymphatics of the, 16
 - nerves of the, 16
 - removal of the, after laparotomy in uterine rupture, 276
 - rupture of the, 186-190
 - utricular glands of the, 10
 - vessels of the, 10
- Utricular glands, 10
- Vagina, anatomy of, 6
 - atresia of, obstructing labor, 114
 - lacerations of, 190
- Vaginal douche for inducing labor, 267
- Varicose veins in pregnancy, 54, 116
- Veratrum viride in eclampsia, 196
- Version, 251
 - by combined external and internal manipulation, 254
 - by external manipulation, 252
 - by internal method, 256
 - cephalic, 251
 - difficulties encountered in, 260
 - indications for, 251
 - in placenta previa, 261
 - spontaneous, 145
- Vertex presentations, 84
- Vesicle of evolution, 23
- Vesicular mole, 62
- Vestibule, 4
- Villi of chorion, 32
- Vitellus, 20

Vitellus, segmentation of the, 26

Vitelline nucleus, 25

Vitriform body, 31

Vomiting in pregnancy, 42

Vulva, 1

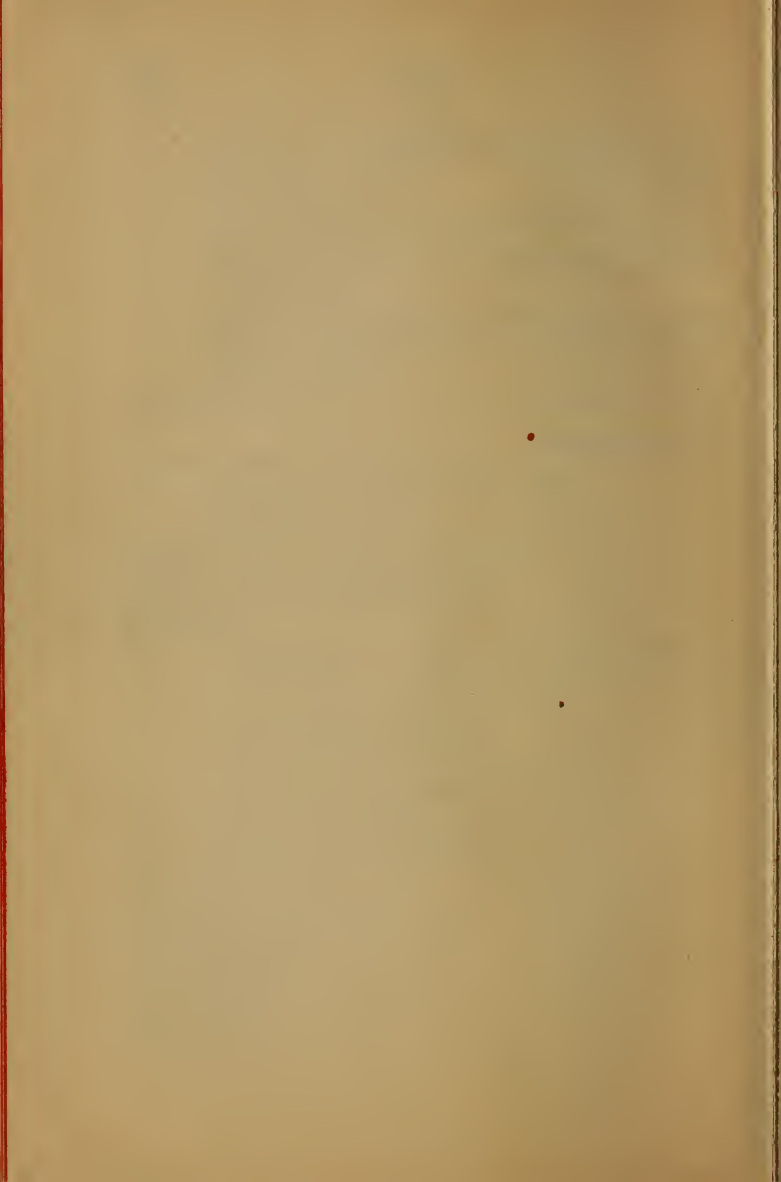
Vulvo-vaginal gland, 5

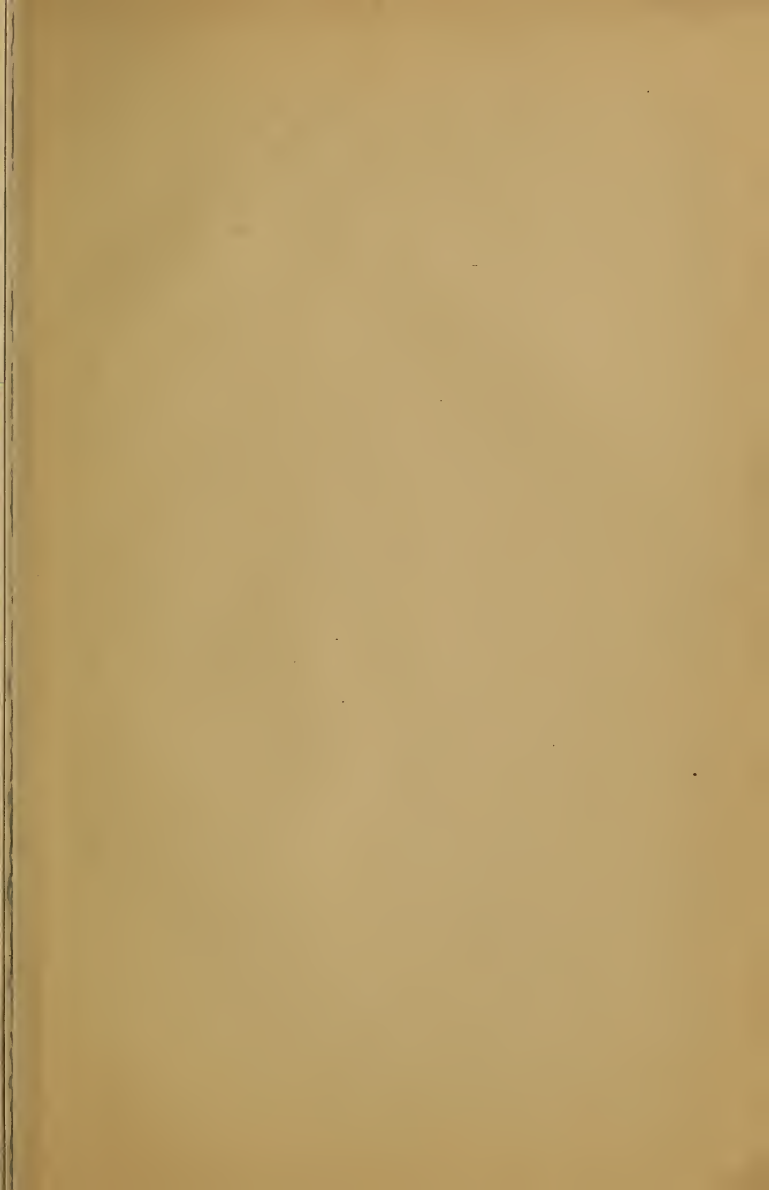
Wharton's gelatin, 36

Wolffian body, 16

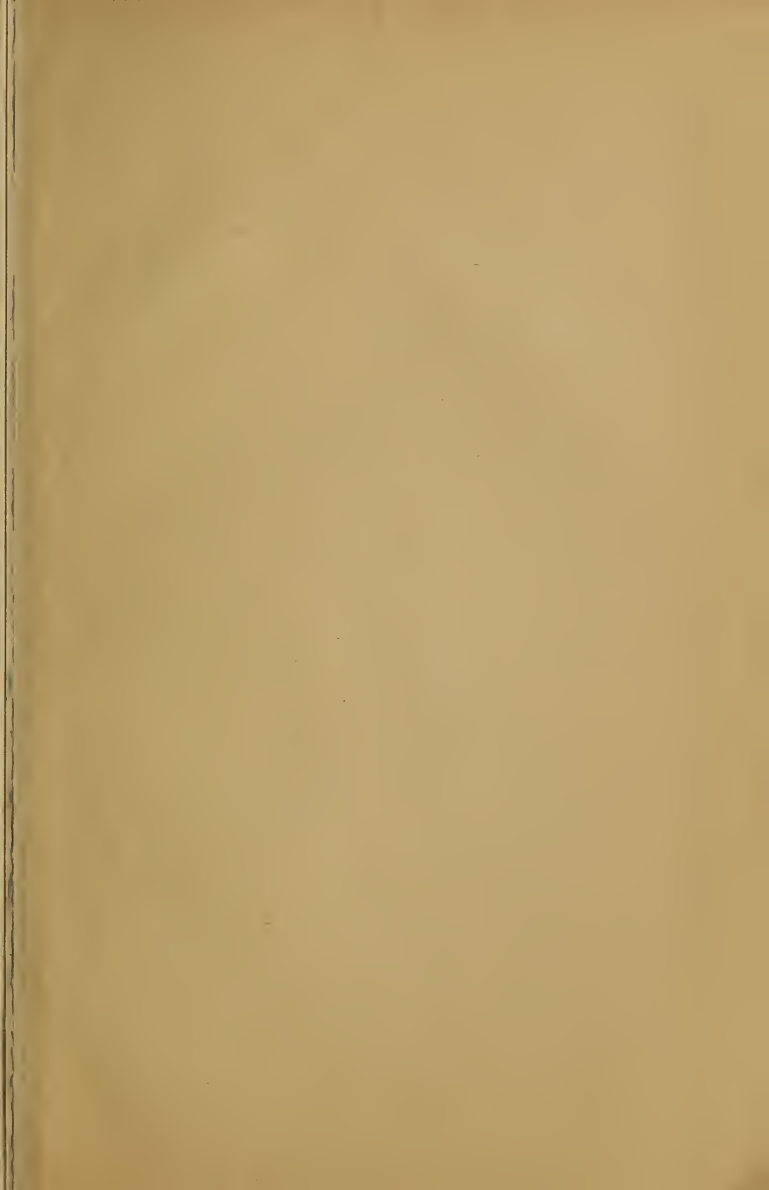
Yolk of ovum, 20

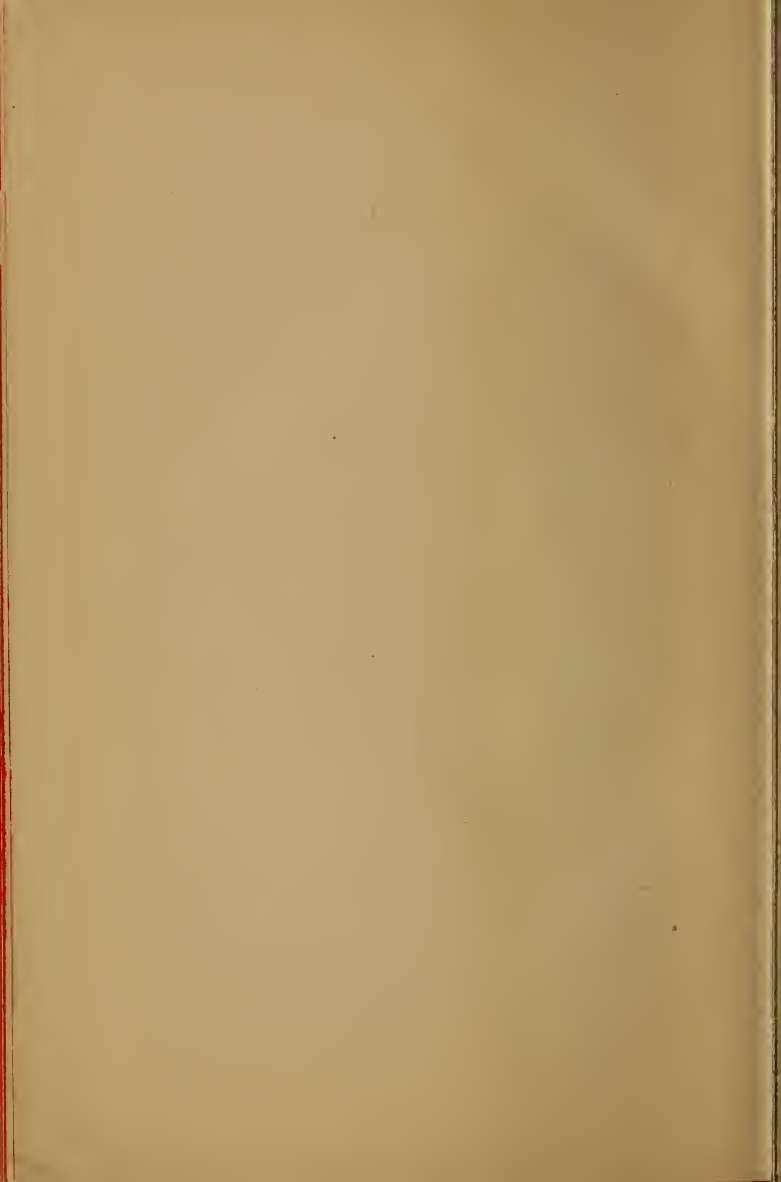
Zona pellucida, 20°

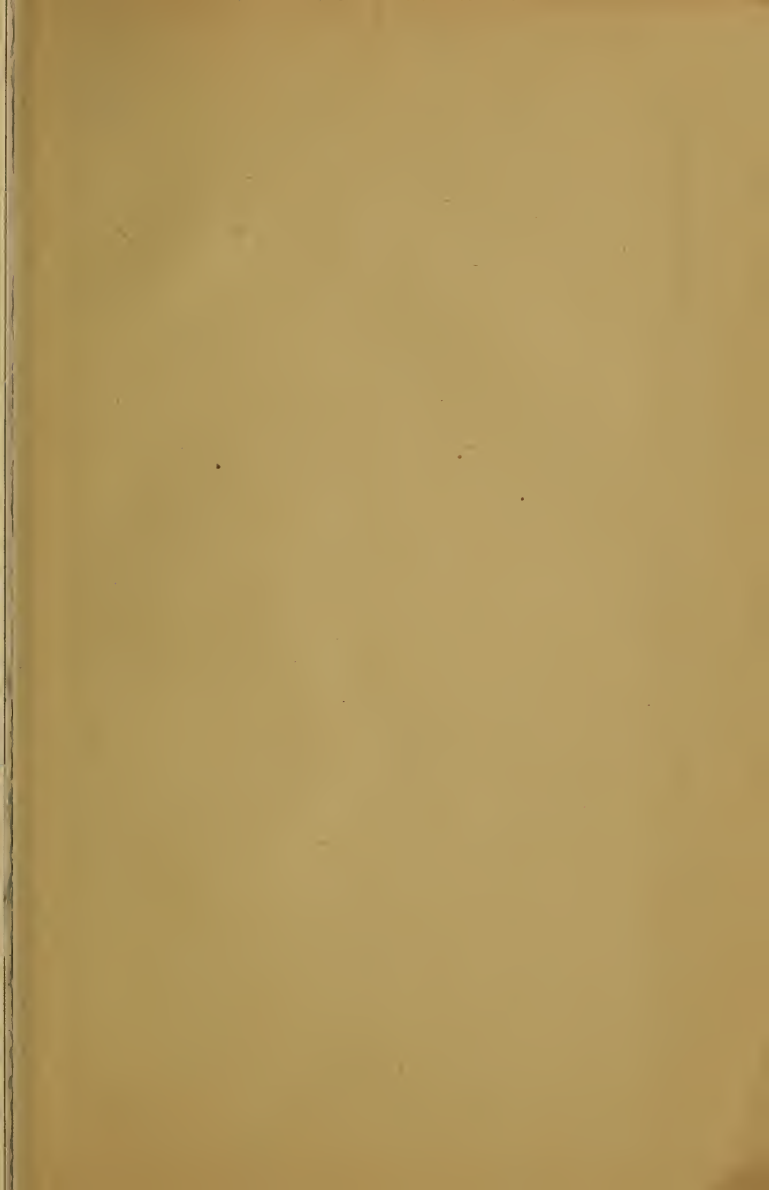


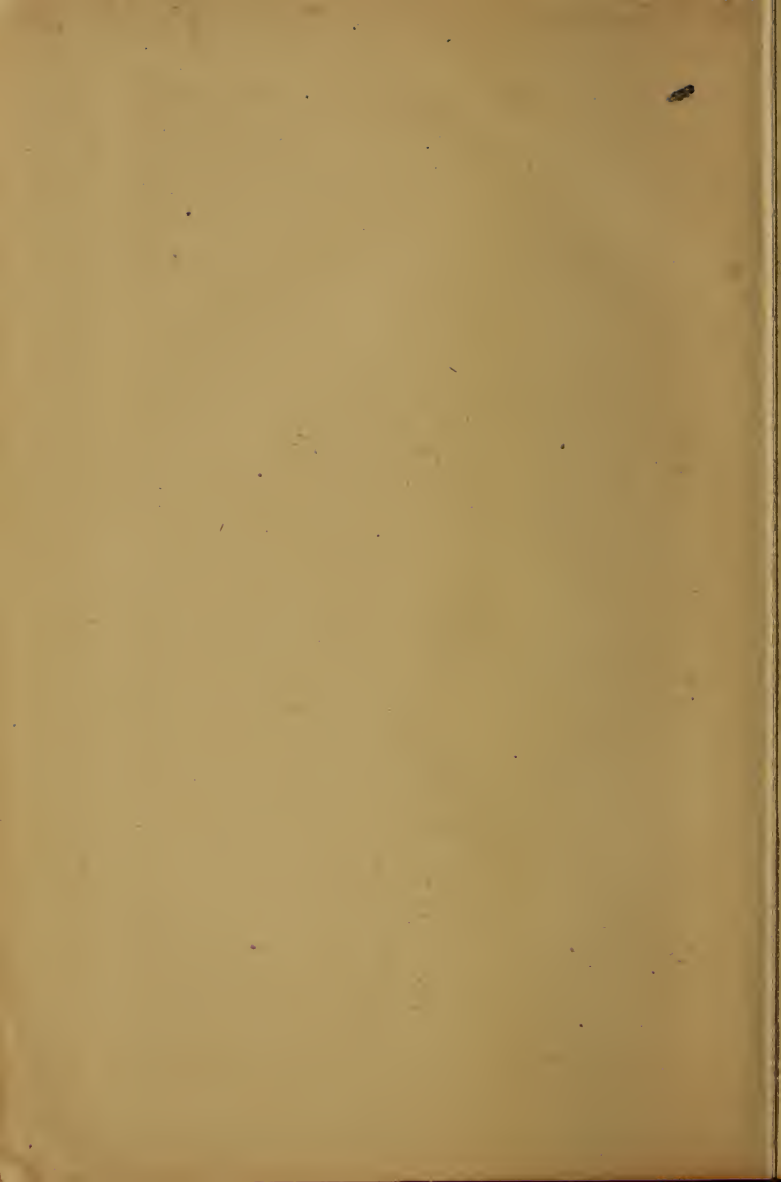


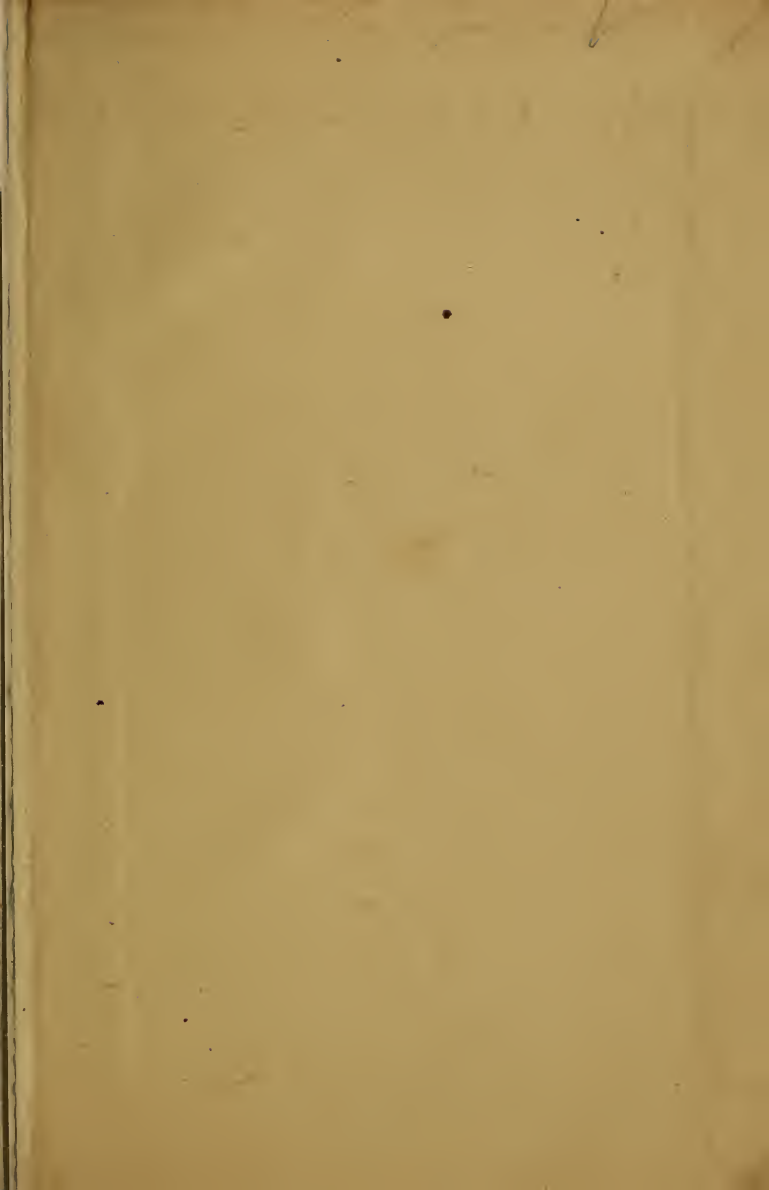












LIBRARY OF CONGRESS



0 021 062 535 5